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NO. 1

ORIGINAL COMMUNICATIONS.

TREATMENT OF THE TOXEMIA OF PREGNANCY.*

BY

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At the present time we believe that the toxemia of pregnancy is due to a disturbance of nitrogenous metabolism. This view is held by Ewing, Stone, Edgar, and Williams, to all of whom great credit is due for original work relating to this most interesting subject. Inasmuch as prophylaxis and treatment must depend on our knowledge of the pathology of the condition, let us consider briefly this phase of the question.

Ewing¹ says that the exact nature of the disturbance of nitrogenous metabolism which is responsible for the clinical manifestations of the toxemia of pregnancy, is a failure of oxidizing capacity on the part of the liver. For this reason the proteid derivatives, principally amido-acids and ammonia, which are normally combined by the liver into urea, are no longer combined, but circulate freely in the blood in a poisonous form, and are to some extent excreted by the kidneys. Other proteid derivatives such as those containing sulphur, fail to be oxidized, and doubtless contribute to the toxemia. The clinical manifestations vary from mild vomiting, which should be regarded as a mild toxemia,

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to acute yellow atrophy, which, however, Ewing states is often followed by recovery. He believes that the systematic study of the urine will show that unoxidized proteid derivatives are invariably present in comparatively early stages of the severer cases. Instead of urea, uric acid, ammonia, leucin, tyrosin, and other unoxidized proteid radicles appear in the urine, and instead of sulphates there are unoxidized sulphur compounds. As leucin, tyrosin, and ammonia are estimated with urea by the hypobromite method, the latter is unreliable. He believes that the examination for these proteid derivatives will be a fair indication of the severity of the case. Functional disturbance of the liver is usually, but not always, attended by severe anatomical lesions, and secondarily functional disturbances and anatomical lesions of the kidneys follow. Synthesis of urea is a liver function, and this failing, liver changes develop first, after which the kidneys are affected.

Stone,² in a recent paper on the toxemia of pregnancy, states that the kidney changes are essentially secondary, and further states that under the clinical titles of hyperemesis gravidarum, eclampsia, and acute yellow atrophy, we have found enough to warrant a definite statement that they are one and the same disease. Stone quotes Minkowski and others as having clearly shown that the disturbance of nitrogenous metabolism in the liver, which lies at the foundation of the toxemia of acute yellow atrophy, does not always lead to a diminution in the total excretion of urea, but rather to a diminution of the ratio between the urea and the total nitrogen of the urine. Excess of ammonia and not the loss of urea may be the danger signal. He states that we must expect to find in the toxemia of pregnancy an excess of ammonia or amido-acid nitrogen, together with a loss of urea nitrogen. The hypobromite method includes both the urea and ammonia nitrogen, and hence the author calls attention to its unreliability as the final test for nitrogen. Albumin is certainly not a reliable guide, for it is frequently absent in grave cases. Leucin and tyrosin should be determined not only microscopically but chemically. Stone states also that the presence of indican is of secondary importance.

Williams³ states that normally from 3 to 5 per cent. of the excreted nitrogen is in the form of ammonia, whereas in the pernicious vomiting of pregnancy the amount of nitrogen put out as ammonia, as compared to the total nitrogen of the urine, may be

as high as 30-46 per cent. In other words, large amounts of nitrogenous materials escape oxidation and conversion into urea. According to Williams, a marked increase in the ammonia coefficient in pernicious vomiting indicates the emptying of the uterus, and he gives 10 per cent. as the danger signal. Williams also states that while, in pernicious vomiting, the total nitrogen excretion is approximately normal, in eclampsia it is diminished. On the other hand, in pernicious vomiting the ammonia coefficient is wonderfully elevated, while in eclampsia the ammonia coefficient is the same.

Sondern⁴ states that acetone, diacetic and betaoxybutyric acid are almost invariably the first abnormal evidences found of the toxemia of pregnancy.

Acetone is the first found in hyperemesis, and then if a cure is not effected, the diacetic and betaoxybutyric acids develop. He advises, if the acidosis is not promptly relieved, the determination of total nitrogen and urea by reliable methods, followed by complete nitrogen partition, although he doubts the value of this complex procedure.

Enough has been said, we think, to show the great practical value of expert examination of the urine, and also that the ordinary tests for albumin and urea are wholly inadequate, at least in what might be termed the suspicious cases. Where there is any uncertainty with regard to the diagnosis, the urine should be thoroughly examined for evidences of disturbed nitrogenous metabolism. We are convinced that work along these lines is in the right direction, offering, as it does, at the present time, the most valuable information at our command.

For convenience let us classify all cases of toxemia as follows:

1. Toxemia with persistent vomiting.
2. Toxemia without persistent vomiting and without convulsions.
3. Toxemia with convulsions, or eclampsia.

1. Toxemia with persistent vomiting is the so-called incoercible or persistent vomiting of pregnancy or hyperemesis gravidarum.

At the present time we believe that this condition is caused by the retention in the blood of poisonous products, the direct result of defective nitrogenous metabolism. While it is true that some of these cases of persistent vomiting may be of nervous origin we believe that they should be regarded as being very probably of toxic origin, for not only has this fact been demonstrated in

many instances, but we believe also that we can best subserve the patient's interest by regarding the condition as the evidence of toxemia. Knowing the grave source of persistent vomiting, we shall be the more earnest in our efforts to eliminate the poison, and, failing to accomplish this result, to empty the uterus.

Treatment may be divided into (1) *gynecological*, (2) *hygienic and dietetic*, (3) *medicinal*, and (4) *obstetrical*.

1. *Gynecological Treatment*.—Inasmuch as some cases of vomiting have been benefited, if not indeed cured, by the correction of some abnormal condition in the genitals, an examination should be made for displacements of the uterus, erosions of the cervix, etc. The uterus should be held in its proper position by the use of tampons or a pessary, and erosions should be cauterized with a strong solution of silver nitrate (10-12 per cent.), or equal parts of carbolic and alcohol, to which has been added a little sulphate of zinc (grs. v- $\bar{5}$ i). Cocaine has been applied to the cervix and upper vagina with apparently good results in some cases, although personally I have had no success with this treatment. Sexual intercourse, should, of course, be prohibited.

2. *Hygienic and Dietetic Treatment*.—The patient should be in bed, with absolute freedom from all household care and worry of any kind; visitors should be excluded, the room kept quiet, and the surroundings must be made as attractive as possible. The nurse should endeavor to divert the patient's mind as far as possible from her condition, for unquestionably a cheerful mental attitude is of great help in the treatment. A warm soap and water bath should be given each day in order to facilitate elimination of the poison through the activity of the skin. In the milder cases the patient may be able to retain very small quantities of nourishment, given frequently. Among the most useful articles of diet the following, in my experience, have proven most valuable: milk with vichy or lime water, peptonized milk, clear coffee, chicken, beef, oyster and clam broths, beef juice, koumyss, zoolak, liquid peptonoids, and panopepton. The latter are to be given in small quantities and served ice cold. Liquid peptonoids especially has been of great value, in some cases being retained better than anything else. In the severe cases, where the patient is unable to retain anything by mouth, rectal feeding should be resorted to, all nourishment by mouth being stopped. Every six hours the bowel should be irrigated with saline solution, this to be followed after one hour has elapsed, by a nutritive enema of from 4-6 oz.

given to the patient while lying on her left side, with the hips elevated.

The following formula has given good results: the whites of two eggs, whiskey or brandy, $\bar{5}i$; a pinch of salt and peptonized milk to make $\bar{5}vi$. I have also tried liquid peptonoids in $\bar{5}i$ doses, given with peptonized milk, and have seen great benefit follow its use.

In addition to these nutrient enemata a saline infusion of one pint should be given once each day in order to alleviate thirst and promote elimination.

3. *Medicinal Treatment*.—It would be practically impossible to enumerate all of the drugs which have been advocated for the relief of vomiting in pregnancy. Sodium bicarbonate, bismuth cerium oxalate alone or in combination, cocaine, menthol, and tincture of nux in minim doses, have been, perhaps, most useful. If gastritis is present, lavage should be used, and one should bear in mind the possible existence of a gastric ulcer which may demand treatment.

The bromides, with or without chloral, given by rectum, have been of advantage at times. Morphine should be reserved for the severe cases, if indeed used at all. The bowels should be moved by enemata, with the occasional use of a series of calomel, gr. $\frac{1}{4}$, every fifteen minutes for eight doses, followed by a Seidlitz powder. Calomel is superior to any other drug in its action upon the liver and bowels, and should be used frequently in the toxemia of pregnancy.

In the severe cases it is necessary to give high enemata containing sulphate of magnesia, also hot packs to stimulate the activity of the skin. In these cases, as in the treatment of eclampsia, prolonged irrigation of the colon with hot normal salt solution is of great benefit, followed by the retention of a quart. The heart action should be sustained by the use of stimulants.

As Ewing¹ has stated, colonic infusion in some instances will not avail, as the system will not absorb the fluid, and it is necessary in the severe cases to resort to intravenous infusion.

Ewing¹⁰ states that he has recommended the use of Ringer's fluid, purely on theoretical grounds, as he has had no experience with it. The formula for this solution is as follows: Sod. chloride, gm. 7; calc. chloride, gm. 2; pot. chloride, gm. 1; sod. bicarbonate, gm. 1, and distilled water up to 1,000 c.c. Ewing states that the formula certainly meets requirements as they are believed to exist

in acute yellow atrophy and acid intoxication. He states further that if any infusion is to be used, the formula given has advantages over any other proposed. The salts must be added to boiled and sterile water charged with oxygen.

4. *The Obstetrical Treatment* consists of two operations—(1) dilatation of the cervix (the so-called Copeman method), and (2) the emptying of the uterus.

The dilatation of the cervix with the finger or metallic dilator has certainly seemed to cause a cessation of vomiting in some instances. Within the last few years every other plan of treatment failed to relieve the persistent vomiting in a patient under my care, but after dilatation the vomiting ceased almost immediately and the patient made a rapid recovery.

The interruption of pregnancy is accomplished by the operation of curettage, or by the dilatation of the cervix, followed by the use of a tampon, in the expectation that abortion will be terminated spontaneously.

One of the most difficult questions which we are called upon to decide is this one of the necessity of emptying the uterus. In many instances the operation is followed by the death of the patient.

Edgar⁶ states that persistent vomiting may or may not be cured by the death of the fetus. Out of 46 fatal cases, no less than 18 died after spontaneous or induced abortion. In a recent case seen in consultation the patient died four days after the uterus was emptied.

Hirst⁵ reports 57 cases of pernicious vomiting treated by the usual methods with a mortality of 50 per cent. Thirty-six cases were treated by the induction of abortion, with a mortality of 25 per cent. Personally Hirst has induced abortion for the condition twelve times, with two deaths, these having occurred in patients who were moribund at the time of operation.

If interference is to be followed by good results, it must be done early, for in the experience of Stone² and others, the operation in the severe cases is so frequently followed by the death of the patient that the advisability of performing the operation is open to serious question. It is to be hoped that in the future we shall be able to state definitely the precise time beyond which the prolongation of gestation is dangerous, but at present we can assert that where acetone and diacetic acid are present and constantly increasing in amount, or where the ammonia coefficient is

high, the operation is demanded in order to save the patient's life.

Toxemia of Pregnancy Without Persistent Vomiting and Without Convulsions.—The symptoms of toxemia include headache, irritability, restlessness, lassitude, insomnia, somnolence, apathy, lethargy, pruritus, loss of appetite, nausea, occasional vomiting, flatulence, constipation, decreased urinary secretion, edema, visual disturbances, high-tension pulse, pain and tenderness in the epigastric or right hypochondriac region. The urine may show albumin, decreased urea excretion, casts, indican, leucin, tyrosin, acetone, diacetic and betaoxybutyric acids, and the ammonia coefficient may be high.

We believe the condition is due to toxemia, and the chief treatment must be eliminative. In mild cases the diet is modified by taking away the red meats, and reducing the ingestion of nitrogenous food to a minimum. In severe cases the diet should be chiefly milk. The patient must have plenty of fresh air, and at least during the winter months woolen underwear should be worn.

Elimination must be favored in every way possible. In the mild cases the skin may be kept in active condition by moderate exercise, massage, and daily warm soap and water baths, but in the severe cases hot air baths and hot packs are indicated.

Pilocarpine is advised by some and by others condemned. The kidneys may best be stimulated by copious draughts of water, at least six or eight glasses being taken in each twenty-four hours. Lemonade, to which pot. bitart. has been added, two drachms to the quart, has given excellent results, while in some cases benefit will be derived from the use of sod. bicarb., grs. x. four times a day. The bowels are to be kept well open, in the mild cases by the use of cascara, podophyllin, aloes, the laxative mineral waters and calomel in small doses, followed by a saline. In the severe cases calomel combined with compound jalap powder, or in the form of the compound cathartic pills, will usually act well. In cases where eclampsia seems imminent, croton oil or elaterium may be used. If the bowels do not move well, high enemata of mag. sulph. and ol. ricini should be given, $\mathfrak{z}\text{i}$ of each.

Another very important measure in the treatment of these cases is the use of colonic irrigation, large quantities of hot saline solution being especially useful in removing all poisonous products from the intestinal tract. In the most severe cases the intravenous saline infusion should be given. Venesection, if used, would natu-

rally be reserved for those cases in which the pulse is full and strong, the face congested, the urine scanty and, in other words, where convulsions seem imminent. Under such conditions the withdrawal of 16-20 ounces of blood has been followed by marked improvement in many cases, and should be advised. For high-tension pulse and as sedatives we advise nitroglycerin, veratrum viride, chloral, and the bromides, repeating as frequently as the severity of the symptoms indicates. The use of these drugs will be discussed more fully in the treatment of eclampsia. Headache, pruritus, insomnia, etc., must be relieved by the various measures used for the relief of those conditions. Elimination is, without question, the most efficient factor in the treatment of toxemia, but if such treatment fails, the symptoms increasing in severity and the urinary evidences of toxemia become more marked, the uterus should be emptied. Labor should be induced, and the cervix dilated by the use of the modified Champetier de Ribes bag, and delivery may be completed by forceps or version. Labor in these cases of toxemia should not be prolonged, and we advise early interference where there is delay.

The use of bougies for the induction of labor has, in my practice, been almost entirely supplanted by the hydrostatic dilating bags.

Toxemia with Convulsions or Eclampsia.—Prophylaxis. Eclampsia is always preceded by some of the symptoms already mentioned in the consideration of the toxemia of pregnancy. To prevent the development of eclampsia we must be on the lookout for and treat the preceding toxemia. Energetic treatment will generally prevent eclampsia, but we believe that, in spite of the greatest care, eclampsia will occasionally be met with, and therefore we cannot agree with those who believe that the disease is entirely preventable.

The precise nature of the poison with which we have to deal is as yet obscure, and we do not as yet know the point beyond which we dare not allow pregnancy to proceed, and until these points are very definitely settled eclampsia will occur. The treatment of eclampsia may be divided into (1) the control of the convulsion, (2) the elimination of the poison, and (3) the emptying of the uterus.

For the attack itself we use chloroform and, if possible, oxygen. To prevent injury to the tongue some hard object should be forced between the teeth. The patient should not be restrained, but should be prevented from falling or striking the head or any

part of the body against a hard object. At the present time the use of chloroform is almost universally advised for the immediate treatment of the convulsive attack. Several writers, however, including Newell¹⁸ and Holmes,¹⁰ advise against its use, on the ground that it is of no service during the convulsion, and that it may do harm. Oxygen is of great value, but unfortunately is rarely at hand. For the control of the convulsions three drugs have been most extensively used, namely, veratrum viride, chloral, and morphine. At the present time veratrum and chloral are the drugs upon which chief reliance is placed, and in our own country, at least, veratrum seems to be the more generally used.

Veratrum, first used by Baker in 1859, is most highly praised by Jewett, Edgar, Flint, Davis, Reamy, Carstens, Zinke, Fry, and others. Hirst combines the use of veratrum and chloral; Cragin and Webster use it when the pulse is strong and rapid, with tension. Parvin and A. Laphorn Smith use it combined with morphine.

Jewett¹⁰ states that increasing experience more than confirms all that he said of veratrum viride, in the paper which appeared in the *Trans. Am. Gyn. Soc.* for 1887 (vol. 12). At that time he reported 22 cases of eclampsia treated by veratrum, with four deaths, a mortality of 18 per cent. He warns against allowing the patient to rise in bed while under the influence of veratrum, because the heart action becomes tumultuous. Veratrum is a powerful vasodilator, and its good effects in eclampsia lend support to the theory that the convulsion is due to a spasm of the cerebral arterioles. By dilating the renal arteries it has a diuretic effect. Jewett believes he has treated and seen eclampsia treated with veratrum in between one and two hundred cases.

Edgar⁶ states that when the pulse is strong and rapid veratrum is second only to chloroform. If the pulse is weak he prefers chloral and morphine. He claims that veratrum reduces the temperature, controls the convulsions, relaxes the cervix and is a diaphoretic and diuretic.

Flint⁷ uses veratrum as a routine practice. Davis⁸ says it can be used to the greatest advantage.

Reamy,²⁰ in 1895, in speaking of veratrum, says that it has been claimed that blood-letting will, with equal promptness and certainty, produce diminished heart force, and paralyze the vasomotor system, but he declares that venesection within the range of safety will not accomplish these results so well. When the

depression following veratrum has passed the patient is none the worse for it, but this is not true with blood letting. With proper management veratrum may be used without danger, and in morphine we have a certain agent in counteracting any depression caused by it. He claims that veratrum also causes copious diaphoresis and diuresis.

Later, in 1905, Reamy²¹ says that in veratrum we have an agent which fills every indication met by venesection without any of its objections. Veratrum is soon eliminated, and the slow heart and general depression caused by a full dose, say fl. ext. ℥xv-xl, will vanish under a hypodermic of morphine, gr. $\frac{1}{4}$ - $\frac{1}{2}$, or under full doses of whiskey. Immediate arrest of the convulsions can, in most instances, be accomplished by the administration of full doses of veratrum.

Veratrum is a powerful arterial and spinal depressant, causing general vasomotor paralysis, and, as explained by Wood, the drug bleeds a woman into her own vessels.

In all fairness it must be stated that a number of authorities, among them Marx,¹⁰ Grandin,⁹ and Bacon,¹⁸ have had very unsatisfactory results with the drug, while Green¹⁰ never uses veratrum at all.

Dosage.—Jewett¹⁰ prefers the use of Squibb's fluid extract, of which he gives from ℥x-xx hypodermically as the initial dose. and ℥x or perhaps ℥v for subsequent doses, given p.r.n. The prophylactic dose has usually been ℥v.

Edgar¹⁰ gives ℥x-xx of Norwood's tincture as the initial dose and follows this with ℥x every half hour until the pulse comes down to 60.

Flint⁷ gives ℥x of the Norwood tincture, and then gives ℥v every hour until the pulse comes down below 100.

Hirst⁵ gives ℥xv of the fluid extract, and repeats in doses of ℥v if convulsions recur.

A. Laphorn Smith¹² gives ℥x of the tincture and repeats the dose every ten minutes until the pulse comes down to 40. He gives morphine with the veratrum, and has had no death since using veratrum.

Carstens¹⁰ gives the tincture in doses of ℥xxx.

Reamy²¹ says veratrum must be fearlessly given, ℥xx-xxx of the fluid extract, or Norwood's tincture, or ℥xxx-xl by mouth, repeated if necessary.

With reference to convulsions when the pulse has been lowered to 60 or thereabouts we have the following statements:

Jewett¹⁰ has never observed convulsions in a patient who was sufficiently under the influence of veratrum to hold the pulse at 60 or lower. Bacon¹⁰ has seen convulsions persist after large doses of the drug had been given, and when the pulse was in the neighborhood of 60. Allen¹¹ says convulsions do occur. Cragin¹⁰ has seen convulsions once, with a pulse reduced to 60 by veratrum. Marx¹⁰ has seen three cases, with a pulse at or about 60. Carstens¹⁰ has seen convulsions occur under the same condition. It would seem, then, that while convulsions are rare, they do occur occasionally. With reference to collapse caused by veratrum, Jewett¹⁰ states that he has several times seen marked collapse with vomiting and profuse sweating, pallid and clammy skin, after large doses, but he states that the condition is promptly relieved by whiskey or morphine, and while the patient is weak, the collapse does not seem to be dangerous. Very few fatal cases of veratrum poisoning can be found in the literature, almost none.

Reamy²⁰ says that in judicious hands the danger of fatal depression from veratrum is almost nil, and that morphine is a certain agent in the treatment of the collapse.

If the pulse is weak, many writers do not give veratrum, among them Edgar, Cragin and Webster, but Jewett states that he has several times given veratrum with no ill effect when the pulse was weak, and adds that a somewhat feeble pulse does not necessarily contraindicate its administration.

Chloral is also very extensively used, especially by the French and German schools, but also by many American obstetricians, among them Davis, Hirst, Newell, Cragin, Marx, Grandin, Carstens, Edgar, and Flint.

Charpentier⁵ reports 114 cases treated by chloral, with a mortality of 3.5 per cent. Winckel⁵ saved 85 out of 92 cases, with large doses of chloral.

Davis⁸ places chloral as second only to veratrum.

Cragin¹⁰ uses chloral as a routine procedure. Newell¹³ makes free use of it, after the acute stage has passed.

Hirst⁵ uses it in large doses as an adjunct to veratrum.

Jewett¹⁰ uses it frequently after the convulsions have been primarily controlled by veratrum.

Marx¹⁰ and Grandin⁶ use large doses of chloral, combined with sodium bromide. Edgar⁶ and Flint⁷ use the drug occasionally.

Dosage.—Charpentier and Winckel give large doses of 5ss-5i by rectum, and in severe cases, 5iii or more have been given in 24 hours. Hirst gives 5i by rectum and repeats the dose if necessary. Generally speaking, the dose by rectum should be 5ss-5i.

Morphine is especially popular as a means of treatment in England, and in this country is praised by the Johns Hopkins school.

Hirst,⁵ quotes Veit among the foreign advocates of morphine, as reporting 60 cases with 2 deaths, a mortality of 3.3 per cent.

Williams,¹⁴ Allen,¹¹ Newell,¹³ and Bacon¹⁸ advise its use, and Green¹⁰ uses morphine to some extent, but the prevailing opinion in our own country at the present time is certainly preponderatingly in favor of veratrum and chloral, in preference to morphine. Edgar⁶ has practically abandoned morphine for the past three years. Jewett¹⁰ says the best use of morphine is in correcting the unpleasant effects of veratrum. Flint⁷ and Cragin¹⁰ rarely use it. Davis⁸ cannot advise its use (at least in large doses). Grandin⁹ and Holmes¹⁰ seriously object to its use.

It is believed that morphine prolongs the coma following the convulsion, and that it locks up the intestinal secretions by checking peristalsis, and therefore the effects of morphine are undesirable.

Dosage.—Veit⁵ uses morphine $\frac{1}{2}$ gr. for each seizure, having given as much as 3 grs. in 4-7 hours.

Williams¹⁴ gives doses of $\frac{1}{4}$ gr. each, repeating the dose several times if necessary. Newell¹³ gives morphine $\frac{1}{4}$ gr. combined with hyoscyamus, and repeats the dose several times if necessary.

Ice-bags.—For the control of the convulsions, Edgar⁶ and Webster¹⁵ have suggested the use of ice-bags to the back of the head and neck.

The bromides may be used to advantage in combination with other more powerful drugs, but so far as I know, no one relies chiefly upon them.

Thyroid Extract.—According to Lobenstine,¹⁶ Nicholson and Lange were the first to call attention to the thyroid gland in its relation to eclampsia and the preeclamptic state. Lobenstine used the extract in 11 cases of eclampsia, and reached the following conclusions: First, that the extract lower **tension** and favored

diuresis and diaphoresis, but large doses must be given. He advises against its use in the asthenic type of the disease, and says the heart and pulse must be carefully watched. The extract must be fresh and he advises the use of strophanthus and caffein, to tone the heart up for its use.

Finally, he does not claim that the treatment of eclampsia by it is superior to other methods, but he does believe that in some cases it may prove of value.

Elimination, we believe, is the most important part of the treatment. The trouble is caused by a retention in the blood of poisonous products, and these must be eliminated as rapidly as possible. If we are successful in this, convulsions will cease, and therefore we must devote our energies chiefly to the elimination of the toxins from the system.

We must therefore consider catharsis, colonic irrigation, venesection, diaphoresis, and diuresis.

Catharsis, in the opinion of almost all authorities, at least in this country, is best brought about, if the patient is unconscious, by the use of croton oil $\text{m}\ddot{\text{v}}\text{i}-\text{ii}$, given with olive oil 5i , and placed on the back of the tongue. Wright¹⁹ warns against its use where the patient is weak and exhausted, but it is given very generally by almost all authorities. Elaterium in doses of $\frac{1}{8}$ to $\frac{1}{4}$ gr. has also been recommended, and may be used where croton oil fails. If the patient can swallow, repeated doses of mag. sulph. in concentrated solution are ordered, or some prefer the use of calomel 5 grs. with compound jalap powder, $\text{5ss}-\text{5i}$. If the bowels do not move, high enemata containing mag. sulph. $\text{5i}-\text{ii}$, with ol. ric. 3i , are given. Practically all authorities agree as to the great value of colonic irrigation.

There is probably no method so valuable as the use of large amounts of saline for removing all the bowel contents. After thorough irrigation, several quarts of saline should be allowed to remain, in order to dilute the poison in the blood, and to promote the activities of the kidneys and skin.

Venesection, in cases where the pulse is strong and full, with high tension, is advised by Hirst, Webster, Allen, Williams, Flint, Grandin, Marx, Newell, Fry, Zinke, Kirkley and others. Allen²¹ states that venesection is the most important part of the treatment. Kirkley¹⁷ says it is the best prophylactic and the best curative agent. Flint⁷ states that where the pulse is full and strong,

unless delivery is imminent, venesection is indicated. The operation is also indicated after labor, where bleeding has been only slight in the placental stage. Reamy²⁰ believes veratrum to be far superior to venesection.

Williams¹⁴ and others advise allowing the patient to bleed in the third stage of labor. Williams states that if improvement is not marked, shortly after delivery, from 300 to 500 c.c. of blood should be extracted, and if the effect is beneficial, venesection should be repeated. He also states that venesection is indicated in all cases in which delivery is not followed by a cessation of convulsions, no matter what the condition of the pulse may be. Edgar believes venesection to be of doubtful value, while Cragin and Davis seldom use it. After venesection an intravenous infusion may be given, but we believe that such infusion is unnecessary, except in very severe types of the disease, where absorption from the intestine may be very small.

Diaphoresis is best promoted by the use of hot packs, a measure advised by Hirst, Edgar, Davis, Williams, Newell, Cragin, and others. Some prefer, however, the use of a hot-air bath. There can be no question of the value of hot packs, but one must watch the pulse carefully, as marked depression occasionally results from their use. The hot saline irrigation and infusion naturally aid also in diaphoresis. The use of pilocarpine has been abandoned by most obstetricians for this purpose, as edema of the lungs may be caused by it. As we have already stated, veratrum acts as a diaphoretic, and to the list already mentioned thyroid extract may be added.

Diuresis is promoted by catharsis, colonic irrigation and infusion, by nitroglycerin, which is a most useful stimulant as well as diuretic, by veratrum, and by thyroid extract.

Obstetrical and Surgical Treatment.—Veit, Charpentier, Winckel, and many other French, German, and English obstetricians in the treatment of eclampsia use medical treatment alone, unless the cervix is well dilated, when they may use forceps or version. In America, Hirst,⁵ among others, advises using medical treatment and letting the uterus alone, unless the os is fairly well dilated.

Zweifel of Leipsic reports a mortality of 28.5 per cent. with expectant treatment, and a mortality of 11 per cent. under active treatment. He believes that the prompt emptying of the uterus

contributes greatly to recovery. The fact that the mortality of postpartum eclampsia is so much lower than that of the ante- and intra-partum variety, together with the fact that in a majority of cases convulsions cease after delivery, leads the larger number of American obstetricians to believe that the uterus should be emptied as soon as possible, consistent with the integrity of the soft parts. In support of the statement that convulsions as a rule cease after delivery, we offer the figures recently given by Har-rar,¹⁶ who states that in 106 ante- and intra-partum cases, in 69 per cent. no convulsions occurred after delivery. The uterus may be emptied by the use of dilating bags, bougies, instrumental or manual dilation, or multiple incisions, followed by forceps or version; craniotomy, if the child is dead; or one may deliver by Cesarean section, abdominal or vaginal.

All of these methods have their warm advocates. Charpentier claims that Cesarean section in eclampsia is attended by a mortality of 36 per cent. The operation has been performed a number of times in this country, but I am unable to quote any statistics in regard to it. Dührssen's method of using deep incisions has been tried many times, and is advised by Edgar where the cervix is very tense and rigid, especially in primiparæ. Williams, under similar conditions, advises deep incisions or Cesarean section; but adds that unless the operator is competent, it would be better not to operate at all.

We believe that the Bossi dilator is a dangerous instrument, and that there are safer and better methods of removing the cervix as an obstacle to delivery.

Edebohls has reported several cases of eclampsia, treated by renal decapsulation, but the number of cases operated upon up to the present time seems to us too small upon which to base conclusive opinions.

In conclusion, and very briefly, we advise the following treatment of eclampsia:

Medical.—During the eclamptic seizure administer chloroform and oxygen if possible. Prevent the patient from biting her tongue, and from injuring herself by blows or falls. If the pulse is full and strong, with tension, give the Squibb fluid extract of *veratrum viride*, ℞x-xx, hypodermically, and repeat in doses of ℞v every half hour until the pulse is reduced to 60. If the Norwood's tincture is used, give ℞x-xx and repeat in doses of ℞x

every half hour until the pulse is reduced to 60. In case of collapse, use whiskey, morphine and atrophine hypodermically. If the pulse is weak and feeble, rely chiefly on chloral and bromides by rectum in doses of 5ss-5i of each. Where the pulse is strong use veratrum as indicated, combined with chloral by rectum.

If the patient is unconscious, move the bowels by croton oil ℥i-ii, given with olive oil 5i on the back of the tongue. If this is not efficient, give a high enema of sulphate of magnesia and castor oil, of each 5i. If the patient is conscious, give mag. sulph. 5ii every fifteen minutes until one ounce has been given. Then, if necessary, use the high enema of mag. sulph. and castor oil. A hot pack should then be given. The colon should be irrigated with several gallons of saline solution and several quarts left to be absorbed. Intravenous infusion should be reserved for the very severe cases. Venesection, when labor has not yet begun, may be used to advantage in robust patients with a full pulse, 12-16 ounces of blood being removed. If, however, the patient is about to be delivered, a moderate blood loss can be allowed in the third stage, and if necessary, venesection can be performed after delivery. To decrease arterial tension, and as heart stimulant, diuretic and diaphoretic, nitroglycerin is also of great value, while caffeine and strophanthus are second only to nitroglycerin.

Obstetrical.—If labor has not commenced, a modified Champetier de Ribes bag should be introduced and the cervix should be softened and dilated by the use of these bags. When the cervix has been well dilated, complete dilatation by the hand, and deliver by forceps or version.

If labor has already begun, but the cervix is long and rigid, use the bags for softening and dilatation. If the cervix is soft and dilatable, complete dilatation manually and deliver by forceps or version.

If the cervix cannot be dilated by the ordinary methods, Dührssen's incisions or Cesarean section should be advised, but unless the operator feels perfectly able to perform these operations, it would be better, we believe, to rely on medical treatment alone.

The one fact above all to be kept in mind at all times, is, that in elimination lies the hope of the patient's salvation.

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110 WEST FIFTY-SEVENTH STREET.

A NEW OPERATION FOR ANTEFLEXION OF THE CERVIX.*

BY

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(With two illustrations.)

In the several operations which have been devised and practised in the past for the rectification of this malformation of the lower segment of the uterus, notably those of Dr. J. Marion Sims and Dr. E. C. Dudley of Chicago, one defect stands out with great

*Read before the Woman's Hospital Society, March 27, 1906.

prominence; that is, the mutilation of the part in the attempt to secure a nearly straight canal of the organ. Although both were fairly successful in the relief of pain and in the overcoming of sterility, which in very many cases follows this defect in formation, yet the result anatomically has been far from satisfactory. Realizing the fact that in cases of ante flexion of the cervix the posterior portion of the cervix is nearly twice as long as the anterior lip, it occurred to me that taking out a V-shaped piece transversely, from the posterior lip, and uniting the cut surfaces by the aid of sutures,

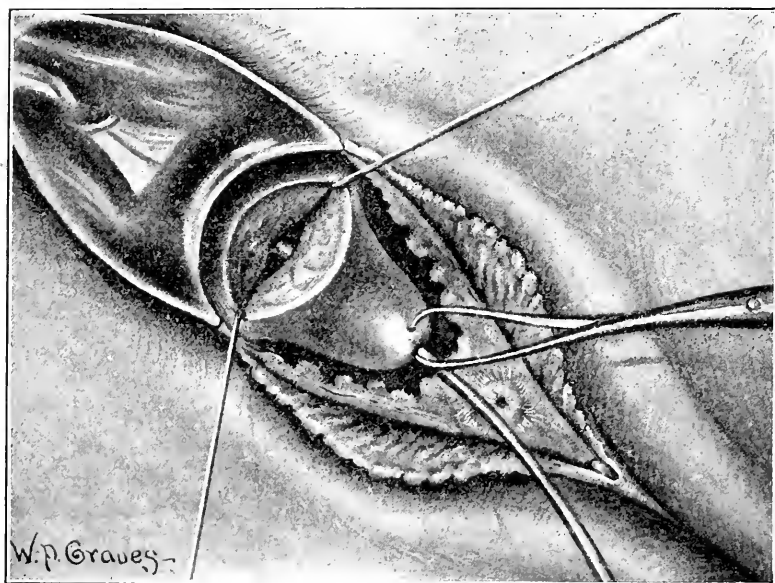


Fig. 1.—Operation for ante flexion of the cervix.

thus shortening this segment, would make a more normal appearance of this infravaginal portion of the uterus.

For the following description of conditions present and details of technique of the operation, together with the drawings for the same, I am indebted to my friend and coöperator, Dr. W. P. Graves.

It will be noticed that with the anteflexed condition, the axis of the cervix points directly along the axis of the vagina, exactly as in complete retroversion. The normally placed cervix points backward nearly at right angles with the axis of the vagina, and it is

to attain this position that the following operation is especially adapted. The principle of the operation is extremely simple and consists merely in removing a transverse wedge from the posterior wall of the cervix, as nearly opposite the point of flexion as possible. This is, of course, the most natural method of solving the mechanical problem involved.

Although the fundamental principle is so simple, the operation itself offers considerable difficulties in execution on account of the anatomical conditions that usually accompany anteflexion. It being a developmental defect, the external organs are often small and undeveloped. From the nature of the case the hymen is in the majority of instances intact, thus preventing the use of a large speculum. It is also frequently difficult to draw the cervix well down, as the uterosacral ligaments, sharing in the general lack of development, are often abnormally short.

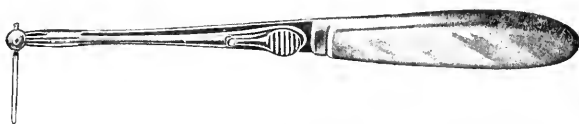


Fig. 2.—Right-angle knife for resecting cervix.

The details of the operations are as follows: With the patient in Sims' position, the cervix is thoroughly dilated, if necessary. The posterior lip of the cervix is then seized with a bullet forceps and drawn as near as possible to the vaginal opening. The position of the wedge is then estimated as nearly as possible opposite the point of flexure, and tenacula are inserted at each apex of the wedge. (See Fig. 1.) In one of my own cases where the anteflexion was well up in the body of the uterus, a wedge was removed so high in the vaginal vault that the peritoneal cavity was accidentally opened. No harm can come from such an occurrence, if thorough aseptic precautions are taken. The amount of tissue to be removed in the wedge is a question of mechanical judgment, depending on the amount of anteflexion present before the patient is etherized. This is an important point, as the anteflexion often greatly relaxes under the influence of ether. The removal of the wedge offers some technical difficulties. These may be overcome either by the use of a right-angle

knife (see Fig. 2.) or by the old-fashioned Emmett's scissors, which are sharply bent towards their point. Usually, however, the ordinary scalpel is sufficient, by drawing sharply down on the base of the wedge, either by tenaculum or double hooks. The position of the canal should at all times be kept in mind, and it is best to keep a sound inserted in the uterus. It is not always necessary to cut into the canal, but if a better position for the cervix, or better coaptation of the edges, can be obtained, there should be no hesitation in doing so. After sufficient tissue has been removed, so that the cervix can be reduced to its proper position, the wound should be closed by silver wire sutures twisted. The reason for using silver wire is for better coaptation, in order to secure primary union with greater surety. There is theoretically a slight danger of nonunion on account of the transverse nature of the incision. There has been no serious difficulty from this source in any of our cases.

We have not as yet had a sufficient number of cases to make a complete report, and for that reason the present article is offered only as a preliminary statement. The results of the cases have, however, been encouraging. From a purely mechanical standpoint the operations have all been successful, the position of the cervix being restored permanently to its normal axis, and in all but one case the symptoms of dysmenorrhea have been greatly relieved. No report on sterility can be made, as the operations have in all cases been done on unmarried women.

22 MOUNT VERNON STREET.

PUERPERAL SEPSIS.*

BY

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IN 1847, Semmelweiss, while assistant in the Vienna Lying-In Hospital, was seriously disturbed at the death rate from puerperal sepsis in that institution. He found that the percentage was higher in the cases that were examined or delivered by students. He was convinced after careful study, that "wound infection" was one of the main factors in puer-

*Read before the Southern Aroostook Medical Association, January, 4, 1906.

peral sepsis, and by having the students wash their hands in chlorine water before attending a woman in labor he reduced the death rate from 10 to 1 per cent. He made known his observations, but they were received with ridicule by many then prominent in medicine.

It is over fifty years since Semmelweiss demonstrated that puerperal sepsis is contagious, but it seems as if now, as well as then, that the truth is ridiculed. The modern maternity hospital has to-day a death rate of practically zero from this disease, but the same does not hold true in private practice, where the bulk of the work is done. Competent observers say that there are thousands of women who die from infection every year in the United States. We take great pride in the advance that we have made in surgery in fifty years, but we should hang our heads with shame at our record in the prevention of puerperal sepsis.

Not all cases dying from this disease are accounted for as such on our death certificates; such a thing would not do, so we find that the puerperal state is complicated in a surprisingly large number of fatal cases with malaria, pneumonia, typhoid fever, etc. It is strange to notice that the diagnosis is made after labor, never before it. I may be wrong, but when I hear that a woman who has been lately confined is "threatened" with any of the above-named diseases, I make a diagnosis to myself of infection.

Why an obstetrical case should not be conducted with the same regard for asepsis as a surgical case, is a mystery, but oftentimes they are not. Some of you may challenge this statement, but I ask you to compare with me the care given and shown for every detail by a surgeon, who is to operate in a private house, not in a surgical amphitheater, and then recall to mind the scene often witnessed in many a lying-in chamber. The surgeon who is to operate through an incised wound that he will close at the end of his operation, will have competent assistants, his equipment will be complete, while on the other hand the obstetrician who will do his work "*inter feces et urinam*," will often conduct his case in a poorly lighted room with a neighbor as an assistant, with an outfit and under circumstances that his surgical brother would regard as disgraceful, and rightly so. Speaking of the equipment often carried by the obstetrician, I think you will agree that many times it

is nothing more than a makeshift, often dirty from former use, and often in the hands of one who is incompetent, or what is even worse, too lazy to do the work as it should be done.

De Lee says it would be a safe procedure to teach that labor is a pathologic process, and that the prospective mother should have attend her the best talent available, and that physicians should possess that talent.

To have good obstetricians, we must have good teaching in the schools, and that teaching should be clinical as well as didactic. The prospective M.D. sees in his surgical clinic a great many abdominal sections, but with the exception of the best schools, his clinical work in obstetrics will be a two weeks' course in the out-patient department of some lying-in hospital. In the first few years of practice a man will have more cases of labor than he will of major surgery; but his training in that which he will do the most work is often, to say the least, meager. With better teaching will come better men, and they are certainly needed.

During the past few years the requirements for admission and graduation have advanced in our schools, and after he graduates, the physician must take an examination before the state board to be allowed to practice. The state board demands that the applicant be a graduate from a school that in all ways fulfills their requirements, and if a physician desires to remove to another state, unless he happily resides in a reciprocating state, he must take an examination, no matter if he has been an honorable practitioner for years. This same state board that demands so much from its physicians and surgeons will issue licenses to and recognize that medical renegade, the midwife. It is absolutely disgraceful that oftentimes ignorant, dirty, and criminally septic women should be recognized as competent to practise the obstetric art. Many of them pose as midwives, while in reality they make a specialty of criminal abortions.

Why should the state recognize midwives? Does obstetric medicine offer the easiest problems in practice? I believe on the contrary, it often confronts us with some of the most difficult. Where does the midwife obtain her "education?" From someone competent to instruct her? No; she gets it as best she can; picks up, as it were, a recognized ability to engage in work that often taxes the brightest minds, men of recognized

skill and ability. It is about time that the state ceased to recognize the midwife unless she is a person of proper training.

Not all the poor obstetrics is performed by midwives. We have the incompetent in our own ranks, and I beg your forbearance in the citation of two cases. I was asked once by a physician in one of our New England cities to attend a case of labor, until he could arrive. I went at his request, and after cleansing the patient, made an examination. I found the patient progressing well into the second stage, with the membranes intact. When the physician arrived about an hour later, I acquainted him with my findings, and with the remark that it was time the membranes had ruptured, he wet his hands at the faucet, and with this careful (?) preparation he ruptured the membranes with his finger nail. I do not know whether the woman became septic or not, but I know that if she did, that man was criminally guilty. I was asked one morning to see a case in consultation that had been in labor some thirty-six hours, with no dilatation of the os, although the pains were strong. I was unable to talk to the patient, as she could not speak English, but her physician said that she had been operated upon about eighteen months previous, for prolapse, and that a ventral fixation was performed. After a thorough cleansing of the genitals, I made an examination, and found that the incomplete os was a loop of cord, and the right shoulder presenting. It was impossible to replace the cord, and examination bimanually convinced me that the dystocia was caused by the previous fixation of the uterus. Not deeming it wise to attempt a version, being unable to diagnose the exact condition of the uterus, the patient was removed to the hospital and a Cesarean section performed. The woman recovered, but the child was lost. If that physician had recognized the actual state of affairs, the life of that child might have been saved.

The organisms causing puerperal sepsis are many, and although we are familiar with many of them, there are, no doubt, many cases caused by bacteria, concerning whose properties we are yet ignorant. The rôle played by the staphylococcus, streptococcus, gonococcus, and coli communis, is very important, and we have records of cases caused by the aerogenes capsulatus, bacillus typhosus and bacillus diphtheriæ.

The entrance into the body and development therein of these organisms, in either pure culture or mixed with others of this

group, cause what is known as septicemia. Acting locally, the bacteria of putrefaction, the anaerobes, producers of gas and a foul discharge, give rise to what is termed sapremia. One is a septic process, and the other a putrefactive one.

J. W. Williams, of Johns Hopkins, says we are not justified in making a diagnosis of sapremia unless on a bacteriological examination we find the lochia free from pyogenic bacteria. This is so without dispute, but we must bear in mind that without this absolute point the clinical features of each individual case are very important. In septicemia we have in the body tissues pyogenic bacteria and their poisons, and it is from these poisons that the patient suffers. If the poison is limited in amount and not too virulent, the woman will get well; if the poison is virulent, and the body unable to form an antitoxin, the woman will die, unless the proper treatment is carried out. In sapremia we have the symptoms resulting from, to quote Roswell Park, "a putrid suppository."

In the majority of cases the infection is a contact one, but we must admit the possibility of autoinfection. Any suppurative focus in contiguity to the generative tract may be fanned into remarkable activity by the processes of labor. In fact any bacteria in the patient's body may be carried to the points of least resistance caused by labor, by the blood stream, but we are blameless in these cases. We are not blameless when we bring into contact with the parturient canal organisms on our hands, clothing, instruments, and dressings. We are not blameless when we are surgically filthy.

Among the predisposing causes of puerperal infection, we have a general low condition of health, great loss of blood, lacerations of any portion of the generative tract, prolonged second stage, retained secundines, blood clots, sharp ante flexion of the body of the uterus, stenosis of the internal os caused by involution of the cervix before the body, and it is obvious that the placental site offers a favorable field for the growth of bacteria.

The lesions in puerperal sepsis vary, and thus we may and do find all gradations from a simple vaginal ulcer to a general pyemia. In some cases we have the agents of infection of so virulent a character that we have no appreciable lesion at their point of entrance as their poisons are so active that a fatal issue occurs in a few hours. The lesion we usually have

to deal with is an endometritis, septic or sapremic, depending upon the causative organisms. This inflammation may remain confined to the endometrium, or it may extend, giving rise to a metritis, metrolymphangitis, metrophlebitis, salpingitis, peritonitis, vaginitis, phlegmasia alba dolens, general pyemia, or any combination of these conditions.

In studying briefly the changes in the endometrium, we find, according to Bumm and Döderlein, a marked difference between the septic and putrid forms. This difference is important from a diagnostic and therapeutic standpoint. With the pathological differences clear in our minds we are better able to treat the existing condition. In the septic form we have a layer of necrosis, which is usually thin, the protective zone of small round cells is either lacking or so imperfect as to render little aid in way of resistance, and the bacteria may be seen throughout the entire uterine wall, even to the peritoneal coat. In the putrid form the necrotic layer is thicker and contains a large number of bacteria, the layer of round cells is well developed, and constitutes an important factor in limiting the disease.

In the condition of parametritis the bacteria may give rise at first to a slight edema that often undergoes spontaneous resolution or progressing to pus formation, result in a local abscess or following the planes of least resistance rupture externally or give rise to a serious condition in the abdominal or thoracic cavity, the involvement to any great amount of the peritoneum usually resulting in death.

In briefly studying the pathological anatomy we noticed the difference between the two forms, and there is a clinical difference also. In the septic form the temperature may rise to 103 or higher with the first chill, and it usually remains up. The lower abdomen is tender, the uterus is sensitive, and the lochia is either scanty or entirely lacking, and without an odor. If the infection is not too virulent, and remains confined to the uterus, the woman may get well after a while, but if the process extends to the peritoneum, and is virulent, the classical symptoms of inflammation of that membrane soon appear and death results. In the putrid type, the patient is not so sick, and the lochia is profuse and foul smelling, with gas bubbles, and recovery is the rule rather than the exception. We have mixed forms and gradations of all, so that each case must be taken by itself.

If we are dealing with a pyemia, the chill occurs later, and the fever is hectic. The symptoms depend upon the metastasis, and if the supply of infected thrombi is continuous, we have symptoms from all the organs involved.

If a woman has a chill, and a rise of temperature following labor, seek its cause. Unless we have a satisfactory reason, we must consider infection. It may be caused by sudden excitement, either pleasant or otherwise, absorption from the intestinal canal, some intercurrent disease. Anyway, find the right reason.

Under the head of treatment one must consider prophylaxis. We should be surgically clean ourselves, as should everything that is to come into contact with the patient. Make the whole procedure a surgical one, and impress the patient and the family of its import. Dispense with the so-called cleansing douche before labor, unless in the face of necessity, and then give it with care.

Wear rubber gloves. You can boil the gloves; you cannot boil your hands. Some say the gloves are cumbersome. That is not so if they fit.

After the birth of the child, do not make a vaginal examination unless there is absolute reason for it.

Suture any perineal wound, unless weakness of the patient or extensive edema contraindicates. Wounds of the cervix, unless compelled by hemorrhage, are better done a little later.

In applying the forceps remember that it is to be used as an aid to nature, not as an instrument designed to drag a child into the world in spite of any obstacle that may exist.

Make as few vaginal examinations as possible. Careful abdominal palpation is better, and there is no danger of infecting the patient.

Do not allow the child to be forced between a loaded bladder and rectum.

Have the patient enter the labor in as good physical condition as possible, and it goes without saying that if sutures have been taken for any reason and have suppurated, they should be removed.

When it can be done, have a bacteriological examination of the lochia, but bear in mind that the clinical signs, both subjective and objective, are important.

If the lochia is foul, profuse and frothy, examine the cavity

of the uterus with your finger. The wall will usually be rough, and the cavity filled with blood clots, secundines or some débris that should be removed. Preferably this removal should be done by the finger, but if the curette is used, great care should be exercised not to destroy the granulation zone, or what is often done, puncture the uterus. Remove the little bits that the finger has broken up by a gentle saline douche, and give the patient a general supporting treatment.

If the symptoms are those of true sepsis, the above-mentioned treatment is not to be used. Above all things do not curette; it is no less than criminal. Not only is the incomplete protective zone destroyed, but the infection is spread. A great deal has been said pro and con as regards the use of the curette in this condition. If a man should say that if one was cold he should remove his overcoat and thus keep the cold out, we would not doubt the mental obliquity of that person. To my mind, it is about as much common sense to advise one to remove the protection that nature is trying to put on to keep out infection. The round cells are of value; let them alone.

In 1896 Carossa advocated the intrauterine irrigation of alcohol. In 1897 Dr. Edward J. Ill, of Newark, N. J., brought the ⁷method to the attention of the American Society of Obstetricians and Gynecologists, and in 1903 Dr. H. G. Wetherill, of Denver, read a valuable paper on this method at the El Paso County Medical Society, at Colorado Springs, Colo. I acknowledge my indebtedness to Dr. Wetherill, as I shall give you the technique he employs himself.

Do not weaken the patient by purges; although they may eliminate, they also weaken, and if the peritoneum is involved, may disseminate the poisons. What is needed is a dilution of them, and there is nothing that will do this so effectually as normal salt solution. It may be given per rectum, subcutaneously or intravenously. Give it, however, and by so doing, you will eliminate, stimulate and dilute at the same time. Concerning the use of formalin solution, I have nothing to offer one way or the other. Several friends have obtained good results, but it strikes me as not being devoid of danger, which condition does not obtain in the use of salt solution. All the cardiac stimulants may prove of value and should be employed when indicated. If the saline is given by rectum, the addition of the fluid extract of coffee is often of much value at times.

The best results in the treatment of this condition have been, to my mind, from the alcohol method, and it certainly should be employed. The man who follows the advice of the men who believe in the use of the curette in this condition is in the same position as the one who follows the opponents of vaccination and diphtheria antitoxin.

In the summary of the alcohol method, I give it according to Dr. Wetherill, as I believe it ideal. Keep the patient very quiet in bed, no purges or food by mouth. If nausea and vomiting occur, employ stomach washing until the nausea ceases; feed by rectum and give the saline every three or four hours, in small amounts, in the manner indicated. Cleanse the rectum by an enema once a day, and employ stimulants to the degree necessary.

Lift the patient carefully onto a table in a good light. Carefully clean the vulva and vagina by soap, water, alcohol and a 2 per cent. carbolic solution. Personally I prefer lysol to the carbolic. Mop and dry the vagina and insert a Sims speculum. The cervix is seized with a volsellum and drawn down and steadied. Clean the cervical canal by means of gauze. The uterine cavity may be irrigated with a normal saline solution or wiped with pure carbolic in the case of a membrane being present, and then dried with gauze. A double current drainage tube is then introduced to the fundus, and a solution of 50 per cent. alcohol is thrown through the tube with a glass syringe to assure no obstruction is present. The vagina is now packed lightly with gauze, and the patient is returned to bed. Every few hours the nurse should inject from two to four ounces of the 50 per cent. alcohol, which will not only cleanse the cavity, but will act as a powerful nontoxic antiseptic.

The tube should be of good size, and may be left in the uterus from three days to two weeks. It should be kept free from obstruction by the use of a piston syringe.

The patient is given no anesthetic when the tube is introduced, and really there is no need of subjecting her to the depressant effects of the same.

The men who advocate this procedure have had good results, and as it is so promising, we owe it to our patients to use it. Personally, I have known it to save lives, and I recommend it to you as a rational, safe, and what is to the point, a treatment that will save many a life if you will use it in time. No matter

how desperate the prognosis may seem, *use the alcohol irrigation. It will do no harm. It may save your patient's life.*

There seems to be, to my mind, a demand for more care in our obstetric work, and I believe the maxim, "if you can do no good, at least do no harm," holds true here, and in this paper I beg to make a plea that we all strive by individual efforts to stop the ravages of puerperal infection.

If I were to formulate a set of rules: How to kill a woman suffering from sepsis, I think the following would succeed if carried out:

1. Use all the salts you can persuade her to swallow.
2. Poison her by strychnine.
3. Use the curette and intrauterine douche indiscriminately.
4. If she is still alive, perform an abdominal section.

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PREGNANCY, WITH RUPTURE OF BICORNUATE UTERUS—OPERATION AND RECOVERY.*

BY

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(With two illustrations.)

THIS brief report is simply to put on record an instance of a condition rarely met with and one that usually proves fatal.

Mrs. R., age 36, born in United States, married nine years.

Family History.—Father, mother, sister, and brothers living and well. Mother and sister have had labors that were physiological in every respect. No history of tumor in the family.

Previous Personal History.—Patient had the usual diseases of childhood, but was otherwise well until menstruation began. Menstruation first appeared at fourteen years of age, and for the first year and a half was very irregular and scanty, often only a few

* Read before the State Medical Association of Alabama.

drops, with much pain and impairment of the general health. After the first two years menstruation was of the thirty-day type, regular, and lasted four days, but was still scanty. The general health improved. At twenty-seven, nine years ago, the patient was married. She became pregnant soon after marriage. Nausea was especially marked during this pregnancy, and lasted for nine months. Except for nausea, this pregnancy was normal. Eight years ago she was delivered of the first child. Labor began at 11 P.M. and the child was delivered naturally at 8 A.M. the following day. Fifteen minutes after the birth of the child the placenta was expressed, and this was immediately followed by a severe post-

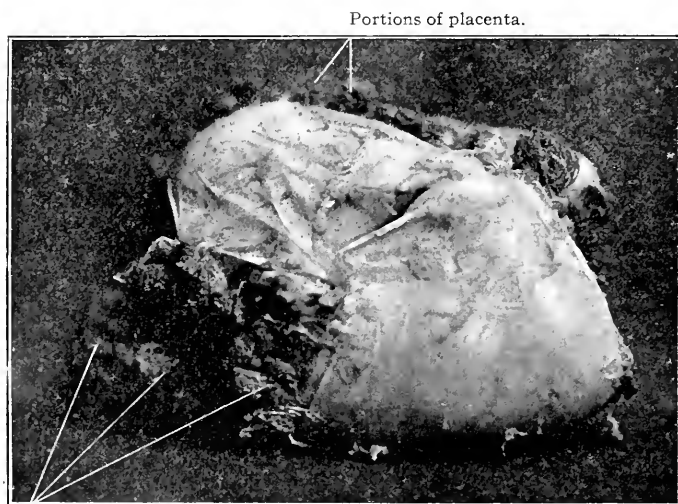


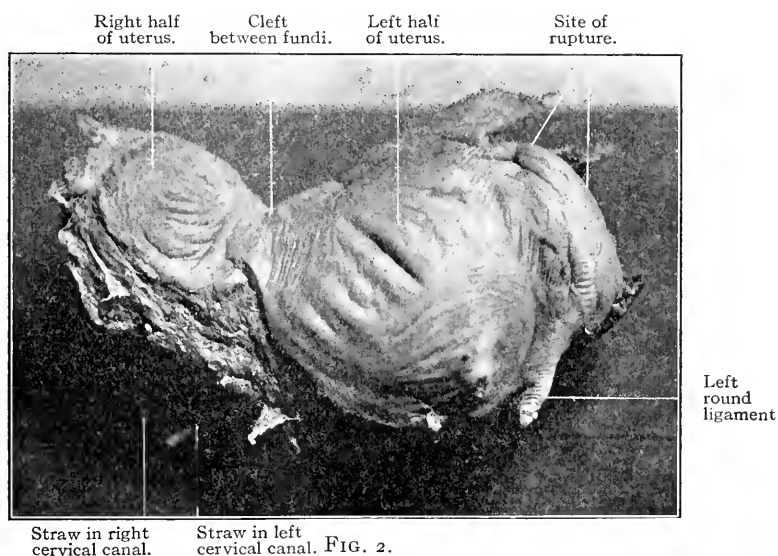
FIG. 1.

partum hemorrhage which nearly proved fatal. There was a gradual improvement after the hemorrhage, and finally a return to good health. During this labor the abdominal enlargement was more marked on the right side than on the left, and after she was up from this labor she was told that she had a tumor on the left side of the uterus.

For eight years following this labor she was well and had neither child nor abortion. Menstruation was regular, of the thirty-day type, lasting four days. She was last unwell on November 7, 1905. Just about this time she was examined by Dr. Gilliam of Indianapolis for supposed falling of the womb. He told her

that she had a tumor of the uterus, or a double uterus, and advised curettage. Upon being told of the probability of pregnancy, he advised that she wait further developments. During this pregnancy she experienced less nausea than in the first. Aside from this, she says that she never felt right during this last pregnancy. She never felt life, and thought all along that something was not right, though she did not know just what it was. On March 28, 1906, she was at the theater in the afternoon, entertained the family as usual that evening, and was in her usual health.

Present History.—At 2:30 A.M., March 29, 1906, she was awakened with sudden sharp pain in the lower left abdominal quadrant.



Pain was severe, constant, and localized in the region stated, and she felt faint and uneasy. It was a different pain from any that she had ever felt before. Her physician was called, and he found the temperature normal and the pulse only 80. Morphia was administered for relief of the pain. At 8 A.M. she was still suffering with pain over the entire abdomen, but not nearly so severe, and the pulse, while a little more rapid, was not over 90. She was seen again at 11 o'clock, and, as she was getting worse, a consultation was advised, and the patient was seen by me at 2 P.M., twelve hours after the first symptoms. At that time there was severe and constant abdominal pain, especially marked in the original loca-

tion, but now present all over the abdomen. She complained especially of difficulty of breathing. Examination: temperature, 97; pulse, 120; respiration, 40. Face was pale, drawn, and the expression was very anxious. Patient was unable to lie down because of the difficulty in breathing. The abdomen was somewhat distended and was held rather rigid all over. Vaginal examination revealed a cervix moderately enlarged and somewhat softened; os slightly patulous. I was surprised to find nothing in the left side, as I had been told that she had a tumor in this location. Vaginal examination gave but little information because of inability to approximate the two hands. Immediate operation was advised, with the tentative diagnosis of a ruptured ectopic pregnancy, and she was removed to the hospital in a carriage.

Operation.—At 5:30 P.M., fifteen hours after the first symptom, median abdominal section was performed. The peritoneal cavity was found full of blood. The fetus, inclosed in membranes, was found free in the abdominal cavity, except part of the placental attachment which held the fetus to the site of rupture. After removal of the fetus there was a profuse hemorrhage, which was controlled with difficulty. A rupture of the left half of a bicornuate uterus in the region of the attachment of the left tube was found. The chief hemorrhage was from the placental attachment. Clamps were applied to control the hemorrhage, but with only partial success. The uterus was flattened from before backward and was about $4\frac{1}{2}$ inches broad. The left Fallopian tube had been destroyed, either in the rupture or by the use of clamps in the effort to control hemorrhage. Supravaginal hysterectomy was rapidly done and the wound closed. Recovery has been uneventful.

Specimen.—Fundus of uterus, instead of the usual rounded appearance, presented a distinct median depression with lateral enlargements, 3 inches long. At the level of the amputation of cervix there were two distinct cervical canals. The right half of the uterus was slightly enlarged and presented an opening into the right tube, but there was no opening in the region of the septum. The left half of the uterus presented, in the region of the tubal opening (left), a large rent. There was an opening, much enlarged, leading into the left tube. The round ligament was attached below and in front of the rent. There was no opening in the region of the septum in the left uterine cavity. Between the torn edges of the rent lay the fragments of the placenta, and there

was a portion of placenta attached to the sac enveloping the fetus. There was no membrane in the right cavity, but a small amount of gelatinous material was expressed from the right cervix during removal.

From the history and findings of this case we are justified in concluding that this woman's first pregnancy was in the right cavity of this bicornuate uterus, which cavity was capable of carrying the fetus to term. The last pregnancy was in the left half, and this was incapable of carrying the fetus to term.

VALUE OF BLOOD EXAMINATIONS IN SURGICAL DIAGNOSIS.*

BY

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THE object of this paper is to call attention to certain features of blood examinations having a bearing on surgical work.

Routine examination of blood includes estimation of hemoglobin, counting the red and white cells, observation of the morphology in stained smears, including search for malarial and other parasites, and in most cases a differential count of the white cells. In special cases blood cultures are also made.

In surgical diagnosis the number of red cells and the percentage of hemoglobin are not of direct value in determining the character of the disease, but the figures obtained give the surgeon an idea of the amount of anemia secondary to the lesion, as for example the anemia accompanying a carcinoma of the stomach or one following a hemorrhage; and when the question of operation arises, these figures should guide him in determining its advisability.

Of much more importance from the surgical standpoint is the enumeration of the white cells. A white cell count is important, first, in certain noninflammatory conditions, especially in enlargement of the lymph nodes. In order to eliminate a lymphatic leukemia, examination of the white cells is necessary, and a knowledge of their number will also throw light upon enlargements of the spleen. We also find white-

*Read before the Woman's Hospital Society, March 27, 1906.

cell changes in chloroma and multiple myelomata. In carcinoma and sarcoma increase in the number of leucocytes is indicative of secondary changes of an inflammatory nature in the surrounding tissues, *e.g.* ulceration in carcinoma of the stomach. Second, we have leucocytosis in inflammatory conditions. During the past ten years it has been customary in hospital work, and with many in private work, to have leucocyte counts made in all inflammatory conditions, whether surgical or medical, and we now have a fairly accurate classification of diseases into those in which an increase of the white cells is to be expected and those where their number is unchanged or diminished. It was early determined that in most surgical conditions in which there was an inflammatory exudate, a leucocytosis was found varying in degree as a rule with the severity of the condition. It was also learned that operation in cases with the higher counts almost always showed a collection of pus. There were exceptions, however; some of the severest infections showed a normal count and the diagnosis of pus had to be based on other signs. This brought up the question of body resistance, and the high counts of 20,000 to 30,000 came to be regarded as evidence of good resistance on the part of the individual; the low counts with evidence of profound sepsis as meaning poor resistance and therefore poor prognosis.

Observers studied series of these cases with high counts, taking into consideration the findings at operation, whether or not pus was found, and an endeavor was made to formulate rules as guides to operation, based on the leucocyte count. Thus Bloodgood, in an article published in 1901, gives the counts in various types of appendicitis. In acute cases observed during the first forty-eight hours, with a count of 20,000, he believes it safer to operate. Where several counts are made during the early stages, showing increasing numbers of leucocytes, he believes operation is indicated. He considers a very high leucocytosis within forty-eight hours as suggestive, but not at all positive, of beginning peritonitis. In cases with clinical symptoms of tumor formation around the appendix in which there is improvement in the symptoms, the leucocytes may be low toward the end of the attack and yet pus be present.

In a study on leucocytosis as a point of prognosis in appendicitis, published in 1902, Joy and Wright deal with the ques-

tion from the standpoint of prognosis. They make the following general statement as a result of four years of hospital observations: "The degree of leucocytosis is an index of the severity of the case: a high stationary or an increasing leucocytosis indicates a progressively serious case which demands immediate intervention; a decreasing leucocytosis, save in some exceptional cases, very few in number, to which special reference will be made, points to a case of decreasing severity in which operation may be safely delayed if for any reason it be so desired." The exceptional cases of decreasing leucocytosis to which they refer are those found in very severe attacks where there is an ever-increasing toxemia and loss of resistance as evidenced by the small output of leucocytes.

Enumeration of the white cells was practiced for a number of years before the relative numbers of the different kinds of white cells began to be observed. New and simpler staining methods, notably the Jenner stain introduced about six years ago, led to observations of the relative number of polymorphonuclear leucocytes, large and small lymphocytes, and eosinophiles, in those cases which showed a high leucocyte count. Changes from the normal proportions of the various kinds were noted, but still the total leucocyte count continued to be the guide as to whether or not pus was present. Examination of the last editions of standard works (Da Costa's and Cabot's) on hematology published as late as 1905, shows full descriptions of the leucocytes found in various surgical conditions, and in some cases tables are given of the leucocyte counts in series of similar cases, *e.g.* in cases of appendicitis and pyosalpinx. A relative increase of polynuclears is noted in some of these cases, but no emphasis is laid on the value of a relative polynuclear leucocytosis.

The first published articles that appeared calling attention to the value of differential counts are by Willson of Philadelphia, in 1901, 1902, and 1903. Many clinicians, attaching a false importance to the absolute number of leucocytes found in their cases by laboratory workers, and ignoring equally important physical signs and histories, had made erroneous diagnoses, especially where low counts were found, and had then laid the blame on the laboratory methods. It was in reply to some of these criticisms that Willson published his first article (*American Medicine*, Sept., 1901). He here calls attention to

the value of differential counts, and in a later article (*American Medicine*, March, 1902) takes up the question more fully. One of the cases cited is instructive and illustrates well the point then under discussion.

This was a typhoid case of six weeks' standing, with a temperature which had been down to normal and then had begun to run a septic curve. The leucocyte count was 4,800; polymorphonuclears, 90 per cent. At a later count the leucocytes were 9,200; polymorphonuclears, 92 per cent. A bulging in the apex of the vaginal wall was then made out, and operation revealed a large ovarian abscess containing typhoid bacilli. This was one of the cases where reliance on the total count alone would have been misleading. A second case of small abscess of the axillary glands showed leucocytes, 7,600; polynuclears, 94 per cent.

In considering what shall be termed a relative increase of polymorphonuclear leucocytes we have rather a wide range in the numbers found in normal circulating blood. Some authorities give 62 per cent. as the average; others as high as 70 per cent. There has been an attempt recently to state the percentage at which pus may be looked for. Sondern, in an article published a year ago (*Medical Record*, March, 1905) states that in adults he has never seen 85 per cent. or over of polynuclear cells without a purulent exudate or gangrenous process, irrespective of the total leucocyte count. In most cases this is doubtless true, though any fixed limit for pus at this stage of our knowledge of the subject should be used very guardedly. One case has been cited to me where 90 per cent. of polynuclears were present, but no pus.

The following cases have recently come under my observation and illustrate features of leucocytosis.

CASE I.—Girl, seventeen months old. A diagnosis of cerebrospinal meningitis had been made, and lumbar puncture showed staphylococci. There were also signs pointing to mastoid disease and the leucocytes were examined with reference to this. The total count showed 12,000 and the differential 83 per cent. polynuclears and 17 per cent. lymphocytes. Operation showed a suppurative condition of the mastoid.

In young children, where normally the polynuclears are lower than in adults, the polynuclears generally range lower in inflammatory conditions, but the rise is marked enough to be noticeable.

In Case II, a girl of eight years, a differential count was made to determine the question of abscess in a large mass of cervical glands. They had appeared secondary to a mild attack of scarlet fever, producing a painful swelling of the whole side of the neck with marked rise in temperature. The polynuclear count was 62 per cent. and there was complete resolution in a few days.

The value of the leucocyte count and especially of the differential is well seen in infections of the extremities where there is a marked cellulitis, or in glandular swellings where it is hard to decide whether incision is necessary. A low polynuclear count, even in the presence of a high absolute count, should justify delay in operation with the expectation of resolution.

CASE III.—A man of about forty years. A few months previously he had had an attack of appendicitis and had been planning to have an interval operation. About twelve hours before the blood count he had a second acute attack and was suffering with much pain and distention, with a temperature of 101° F. The leucocytes were 22,000; polynuclears, 83 per cent. At operation the appendix was found perforated, with pus in the pelvis. The wound was drained and there was improvement until the fourth day, when vomiting became persistent and there was a slight rise of pulse and temperature. A second blood count was then made in view of a possible peritonitis. The white cells had fallen to 15,000 and the polynuclears to 72 per cent. Examination of the wound showed a healthy condition, but death occurred the next day from paralysis of the intestines. Following the administration of ether there is a moderate leucocytosis, but this disappears at the end of twenty-four to thirty-six hours, so that a postoperative leucocytosis occurring on the third day, coupled with other clinical signs, is very significant. A decrease in the total leucocyte count, as in this case, with a low polynuclear, should be a strong argument against further operative procedure.

CASE IV.—Woman of about forty years, who had a large abscess in the iliac fossa extending down into the pelvis, which in a subsequent operation proved to be due to disease of the hip joint which had perforated through the acetabulum. Before operation, the leucocytes were 14,700; polynuclears, 89 per cent. One day after operation the leucocytes were 15,500; polynuclears 82 per cent. Two days after operation, leuco-

cytes, 16,000; polynuclears, 79 per cent. There was a large pus-discharging wound, but the persistence of the absolute and relative leucocytosis was doubtless due to the further presence of pus in the hip joint and adjoining region of the thigh, requiring the second operation. The patient was thoroughly septic and nearly died from exhaustion during the operation, hence the comparatively low total count.

From the consideration of such cases, and they could be supplemented by numerous others from the records of our hospital laboratories, certain conclusions can be drawn as to the value of white cell counts in surgical conditions.

1. Knowledge of the absolute and relative leucocytosis in inflammatory conditions is of great value to the surgeon, but only when taken in conjunction with the history and clinical features. The man who operates on the blood count alone runs the risk of opening an abdomen for intestinal indigestion when the cause of the leucocytosis is a pneumonia.

2. In the absence of an absolute leucocytosis a relative increase of the polynuclears coupled with other signs is indicative of a purulent exudate.

3. The absolute leucocytosis is of value in prognosis, the higher counts being seen in cases where there is good body resistance. Low counts with a high percentage of polynuclears and evidence of marked sepsis give a poor prognosis.

4. A differential count should accompany every total count for its proper interpretation: but it is not safe or wise at present to fix any definite percentage of polynuclears as the point at which pus is certain to be found.

5. In certain bacterial infections, *e.g.* with typhoid and colon bacilli, the polynuclear percentage may be below normal, although pus is present, and this must be borne in mind in interpreting the leucocyte counts.

TUBOABDOMINAL PREGNANCY AT TERM.*

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(With one illustration.)

THE report of the infrequent condition of tuboabdominal pregnancy that has gone the allotted prenatal span of two hundred and eighty days and over is of sufficient interest to the society to warrant its recital. It is only within a few years that the medical world believed the condition possible, and even now while there is more allowance given to the possibilities of the placental attachment in extrauterine pregnancy, we are inclined to believe in the existence of only those conditions that can be substantiated by the pathological report. That is safe. The great difficulty in getting an accurate study of the anatomical conditions is that the operation must not be delayed, and consequently the tissues that appear in the field of operation cannot be examined with sufficient detail to learn accurately the site of the fetal sac. There are physical signs that help somewhat in determining the site; whether, for instance, the pregnancy may be one of the broad ligament variety, tuboabdominal, or pregnancy in a bicornuate uterus. The uterus itself is the pivotal point around which the abnormalities occur.

It is very seldom that a normal pregnancy can be mistaken for any pathological condition. When there are undoubted signs of pregnancy and an examination reveals a tumor outside of the uterus, it is the duty of the attending physician to determine as well as he can the exact state of affairs. If the uterus does not grow with the advancing pregnancy and the tumor does, the solution of the problem should be known. It is a fact that all broad ligament tumors have a tendency to displace the uterus upwards and to the opposite side, and if the tumor is a large one it is not easy to reach the cervix. If the tumor grows from the right or left of the cul-de-sac, the uterus is always in front

*Read before the Woman's Hospital Society, February 27, 1906.

and the tumor distinctly felt behind it. These are, of course, only some of the physical signs; but together with the subjective symptoms they lead us to a reasonable diagnosis.

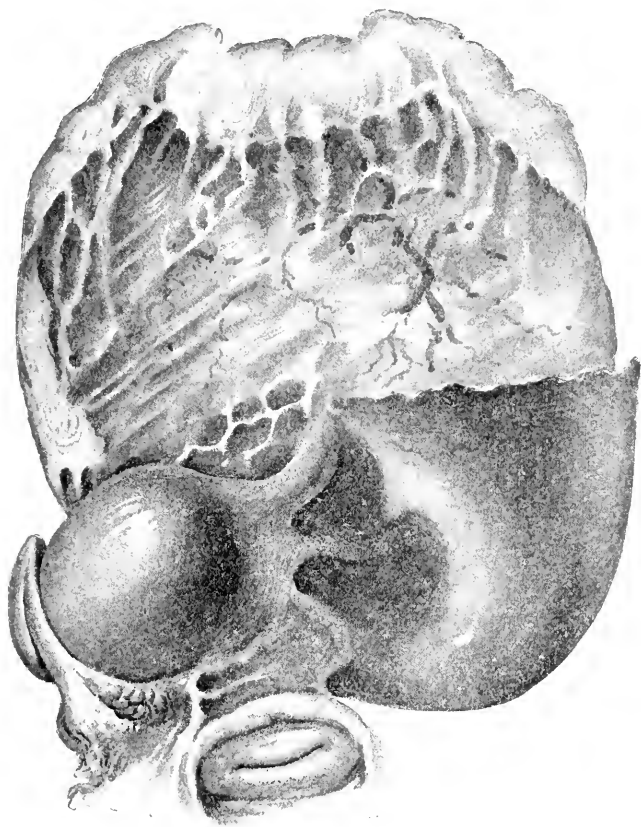
There is reason enough to believe that Tait's suggestion of preexisting salpingitis being a factor in the etiology is true, certainly the histories in such cases strengthen that belief; but why it occurs in some cases of salpingitis and not in others is one of the secrets we are gradually finding out. So far we know that when the explosion takes place in the peritoneal cavity the product is either removed by operation, is absorbed, or if the placenta retains sufficient hold to keep up its circulation uninterruptedly the pregnancy may go to term. If the rupture takes the direction of the broad ligament there is no reason to doubt that under favorable conditions the pregnancy may go on between the folds.

Tait prophesied that the day would come when the attending surgeon would diagnose and watch these abnormal cases, operate and deliver a healthy child. This has been done. I am fortunate enough to report such a victory, but I regret that the conditions were not more favorable for a happy result. As it was our diagnosis was accurate enough and the mother went through the trying operation successfully, but the fetus had been dead for some time, and this marred the complete success of the operation.

The history of the case I wish to report is as follows:

Mrs. E. P. M. is 33 years of age and a native of the United States. She has been married eight years. Seven years ago she became pregnant, but miscarried at the third month. On April 2, 1905, she menstruated for the last time. Some time about the middle of May she was awakened from her sleep by a sharp pain in her left side. This persisted severely for a week, requiring the attendance of her physician. On June 26 she had considerable flow but cannot recall its character. In August there was a moderate flow for one night. There was a great deal of vomiting and constipation. The pain, nausea and vomiting and constipation increased in severity each month, so that by December she had lost thirty pounds in weight. About the middle of January she noticed the tumor suddenly dropped low in the abdomen and remained there. Her physician, Dr. A. B. McDowell, put her confinement date about this time, and finding no indications of labor requested a consultation.

The consultation with Dr. E. P. Porter was held on January 29; she was put under chloroform anesthesia; the uterus was dilated and packed. The next day the gauze was removed with no result. She was then advised to go to the hospital, where we saw her.



Tubo-abdominal pregnancy.

She entered St. Vincent's Hospital on the night of January 30 in very poor physical condition, so poor that we felt that a few hours' rest would improve her strength. Examination revealed a large oval tumor occupying most of the abdominal cavity, especially prominent on the right side. The superficial veins in the upper part of the abdomen were prominent. The breasts

were small and soft, with no secondary pigmentation. No discoloration of the vaginal mucous membrane. On palpation a large doughlike mass was felt over the prominence of the tumor, as were the outlines of a child in an oblique position with the breech resting in the left pelvis. The uterus was soft and about the size of a pregnancy at the fourth month. It was situated anterior to the tumor and crowded to the right side. No fetal heart sounds could be heard and there was no *ballottement*. She was told of the result of our findings and gave her consent to an operation on the following day. At nine o'clock in the morning she came to the operating room prepared for operation. A median vertical incision was made, revealing a tumor occupying the greater part of the abdominal cavity, fairly movable save for some recent adhesions that glued the intestines to the upper surface. The upper half of the tumor was covered by peritoneum and adhesions, through which the placenta could easily be seen, and which extended down to the brim of the pelvis. The uterus was in front and to the right. The left tube was distinct for about two inches from its base and then became lost in the sac wall. The broad ligament seemed to be part of the sac. In order to reach the fetus I was obliged to cut through the lower part of the placenta. This was quickly done and a large male child was brought forth. The hemorrhage was brisk for a few minutes, but by rapidly removing the placenta *en masse* and resorting to pressure we soon had the bleeding under control. We were favored in this by the inactive circulation at the placental site. The cavity now presented a dirty gray appearance, a sad foreboding, but making the best we could of the gangrenous wall by stitching it to the abdominal wall we succeeded in shutting off the peritoneal cavity. The sac was now packed with gauze. On account of the sudden loss of blood which was unavoidable owing to the position of the placenta, the patient's condition was discouraging, but with hypodermoclysis and intravenous infusion of normal salt solution she recovered sufficiently to leave the operating room in fairly good condition. For this valuable help I am indebted to Dr. Alexander Nicoll and Dr. A. M. Bell.

When the child was brought into view we found the cord black and decomposed, the finger tips showed some decomposition, and there were changes about the skin over the abdomen. The bones of the head seemed to be unusually hard. The weight was ten pounds.

The improvement in the patient was slow but steady, and she is now well.

At this late day there is scarcely any need to comment on the management of such cases. After the diagnosis is made there is no excuse to allow the child to die and then in the interest of the mother to select a suitable time for the removal of the product. That kind of surgery belongs to other times. With the advantages of modern technique we should meet the difficulties fearlessly and strive for the life of the child, and the difficulties should not be greater than are met with in the Cesarean operation, outside of the management of the placenta. In my case I was obliged to injure it in order to reach the child, and there was nothing else to do but to remove it as quickly as possible. With a different implantation of the placenta it might have been allowed to remain *in situ* and removed some days later. That may be left to the judgment of the operator.

THE STATISTICS OF ONE THOUSAND CASES OF LABOR.

BY

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THE following medical report gives the statistics of the first thousand cases delivered and attended by the clinic.

The cases were attended by graduate and undergraduate resident students under the supervision of resident staff physicians. The abnormal cases were visited by the author and by Dr. M. M. Stark. The new-born infants were treated under the direction of Dr. Herman Schwarz.

Of the 1,000 cases in this series, all the women were married or widowed. The nativity was:

United States (white).....	280
Russia.....	252
Ireland.....	153
Austro-Hungary.....	71
Germany.....	58
United States (colored).....	56

Fourteen other nations were represented in numbers from 1 to 19. It is an interesting fact that only 6 Italian women

were treated, although the Italians are very numerous in the district covered.

The following table shows the distribution of the cases by ages and the number of pregnancies:

Age.	No. of Cases.	Average No. of Pregnancies.
15-20 yrs.	78	1.6
20-25 "	236	2.1
25-30 "	268	4.3
30-35 "	237	5.4
35-40 "	138	6.6
40-45 "	39	8.3
45-50 "	4	8.3

One hundred and thirty-one patients were primiparæ, 56 women had been pregnant ten or more times. The average number of pregnancies was about the same for the different races, the American-born women, age for age, having quite as high an average number of pregnancies as any others.

In 877 cases in which it could be observed presentation was as follows:

Presentation.	No. of Cases.
Vertex.	835 or 1 to 1.05
Breech.	30 or 1 to 29
Shoulder.	6 or 1 to 146
Face.	5 or 1 to 175
Brow.	1 or 1 to 877

51.8 per cent. were male and 48.2 per cent. were female.

Of 987 children, 26 were still-born. The possible causes of these still births are given in the following series:

Precipitate labor, born before arrival of attendant, vertex.	3
Precipitate labor, born before the arrival of attendant; impacted head, breech.	2
Twins, premature.	4
Premature face.	1
Contracted pelvis, difficult forceps delivery.	1
Transverse presentation, version and difficult extraction.	2
Contracted pelvis and version.	1

Cardiac anomaly.	1
Pelvic peritonitis and hyperpyrexia of mother. .	1
Breech, hydrocephalic head.	1
Breech, large child, difficult extraction.....	2
Hydrocephalus, craniotomy.....	2
Macerated.	2
Cause not recognized.....	3
	<hr/>
	26

Of the children born alive, 10 died in the puerperium:

Case No.	Day of Death.	Cause of Death.
1.....	1st day.....	Atelectasis.
2.....	5th ".....	Pneumonia.
3.....	5th ".....	Peritonitis.
4.....	1st ".....	Prematurity.
5.....	4th ".....	Cerebrospinal meningitis.
6.....	2d ".....	Prematurity.
7.....	4th ".....	Hematoma of brain.
8.....	2d ".....	Hemorrhage under tongue.
9.....	:8th ".....	Cephalhematoma.
10.....	4th ".....	Rudimentary intestine (operation).

Case No. 8 was the victim of an unusual accident. The child, which was large and well formed, was delivered by version. The mother had a contracted pelvis and her three previous labors had been terminated by high forceps operations with the loss of all the children. In the delivery of the aftercoming head of this child, the finger of the operator in the mouth of the child caused an abrasion under the tongue. The bleeding seemed to be trivial, and was easily stopped by the application of styptics. During the night a recurrence of the bleeding was noticed by the parents, who thought it a trifling matter and did not summon medical attendance. In the morning the baby was found to be dead. On examination the stomach was found to be full of blood, which had trickled back from under the tongue and been swallowed.

Case No. 9 died on the eighth day. At birth a large swelling was noticed over the right parietal bone. Labor had been normal, and had been terminated without instruments. On the fourth day convulsions occurred. The left extremities were spastic. The convulsions were tonic and clonic and began

usually in the left upper extremity, extended to the left lower extremity and became general. A diagnosis of cerebral hemorrhage was made. After observation for several days, the child was sent to a hospital for operation for the relief of pressure, but grew rapidly worse and died before operation was undertaken. At post-mortem a large cephalhematoma over the parietal bone was found and beneath all portions of the scalp a large quantity of blood under great pressure. There was no cerebral hemorrhage.

Case No. 10.—On the second day after birth, the child vomited meconium. No stools had been noted. The abdomen was distended. The rectum was found to be pervious for its entire length. A diagnosis of atresia of the bowel was made and the child was sent to a hospital where enterostomy was performed (Dr. E. Beer). The child died thirty-six hours afterward. At autopsy no fetal peritonitis was found. The small intestine was of normal caliber. The entire large intestine was rudimentary, one-third the caliber of the small intestine, but pervious its entire length.

Induction of labor was performed twice. Case 1, rachitic pelvis, eight months. Sterilized bougie was passed between uterus and membranes to the fundus. Labor began twelve hours later. Dilatation was completed manually, and child delivered by breech. Child living, mother living.

Case 11.—III-para. Eclampsia. Symptoms of eclampsia developed three weeks before term. Symptoms were controlled by use of veratrum, chloroform, chloral and bromide by rectum and hot packs. Sterilized bougies were passed to the fundus. Labor began six hours later. Dilatation was completed manually and child extracted by breech, child living. Mother made good recovery.

Eleven cases of marked pelvic deformity were encountered. Of these 2 were scoliorachitic, 4 justo-minor, 3 simple flattened, and 2 flattened, generally contracted. Four of these were delivered spontaneously at term. In 1, labor was prematurely induced, in 4 high forceps was used, in 1 podalic version was performed. There was 2 still births among the 11 cases and no maternal fatalities.

The forceps was applied 42 times. There were no maternal deaths. Four children were still born. Classifying the operations, we find:

High forceps.	11	times
Medium forceps.	15	"
Low forceps.	16	"
		<hr/>
		42 times

Allowing for the abortions, the percentage of forceps cases is 4.36 per cent. In 12 cases where it was considered that the indications for forceps were present, the patient was delivered spontaneously while preparations for the operation were in progress.

In some of these cases, the administration of an anesthetic relaxed the voluntary inhibition of pains. In others the voluntary efforts of expulsion, which had gradually diminished, were suddenly strongly stimulated by fear when the patient viewed the preparations for the operation.

Podalic version was the method of delivery in 20 cases. The presentation in these cases was as follows:

Vertex.	8
Shoulder.	6
Face.	5
Brow.	1

There were no maternal deaths. Of the 8 vertex cases, 1 was delivered by podalic version after forceps had failed. There was marked pelvic deformity in this case.

In 1 other case pelvic deformity was the indication, but in this case labor was prematurely induced.

The remaining 6 vertex cases presented special indications for rapid delivery. Five were cases of placenta prævia; the sixth was a case of eclampsia with frequent convulsions.

In this series of 8 vertex cases of podalic version there was a safe recovery of the mother in all, yet it is noticeable that many of these cases presented serious complications. In considering to what extent podalic version is a formidable operation, we must review statistics presented with discrimination.

In the series of version cases reported from the various maternity services there is usually a rather high mortality. But a careful analysis will usually show that exceedingly grave complications were present in many of the cases. It is not therefore that version *per se* is a serious operation, but that it is the operation of choice in many of the most serious complications of

labor that associates it so frequently in statistics with fatal cases.

Craniotomy was performed twice. Case 1.—Mrs. R. G. III-para; fortieth week. Hydrocephalic head, enormous distention. Head was punctured and three quarts of fluid released. Fetus was then extracted with the Braun cranioclast.

Case 2.—Mrs. B. IV-para; ninth month of gestation. Abnormally large head, high forceps unavailing, no fetal heart heard. Craniotomy and extraction; recovery.

There were two maternal fatalities in the 1,000 cases. The first of these is not properly included as a case of the clinic. The patient, Mrs. S., aged 31, II-para, had engaged a midwife to take charge of her confinement. Pregnancy progressed beyond the time which had been looked upon as full term, whereupon the midwife attempted interference in some manner. Two days later pains came on. Dissatisfied with the condition of the woman, the family enlisted the service of the clinic. On the arrival of the students the patient was found to be having severe pains, which terminated the labor spontaneously after one and one-half hours. The patient was left fairly comfortable; her temperature was 100, pulse 92. Six hours later a staff physician responding to a call from the patient who complained of pain, found a startling clinical picture. The woman was frankly septic, the temperature was 103.6, pulse 120 and full, respiration 44. The body was covered with urticaria-like spots; there were ecchymoses under the conjunctivæ, the abdomen was distended and tympanitic and exquisitely tender. A diagnosis of fulminating peritonitis, or possibly ruptured pus tube was made. The conditions surrounding the patient were so bad that it was thought best to send her to a hospital at once. Here she died while preparations for a laparotomy were being made. No autopsy was obtained.

The other fatal case exemplifies again the character of the cases frequently encountered by an out-door free service, where the aid of the clinic is summoned after labor is well advanced. The students, on their arrival, found the patient in the second stage of labor. She was thirty-six years old, V-para. She had been having severe labor pains for fourteen hours. The membranes were ruptured, the vertex presented, and while the pains were almost continuous and most severe, no movement of the head resulted. The author was summoned. On his

arrival, he found the patient bleeding and nearly exhausted. With the patient under an anesthetic, he carefully made a vaginal examination. With extreme gentleness, he tried to see to what extent the head was movable. On the first upward pressure from his finger, the head passed through the uterine wall, at the same time tearing the anterior vaginal wall. No force had been used in the manipulation. But the uterine wall, because of the long-continued hard pains, had been subjected to such pressure in its contraction upon the unmoving head that it had been thinned and weakened until it offered no more resistance than a wall of wet tissue paper. The child was immediately extracted, gauze was inserted in the uterus and the vagina was packed. The uterus contracted firmly. The patient was in a state of collapse, but reacted, and within twenty-four hours was doing fairly well. For several days there were symptoms of a localized peritonitis but these gradually subsided. On the ninth day, however, septic pneumonia set in and the patient died on the twelfth day after labor. The child lived.

Abortion.—Of the 1,000 cases, 38 were delivered before full term. Of these, 14 occurred during the first three months, 9 during the second three months, and 17 during the last three months of pregnancy.

Cases occurring during first three months:

No.	Age	Para.	Previous Premature Delivery.	Duration of Fever.	Highest Fever	Treatment.	Day of Discharge.	Condition.	Remarks.
1	20	II	.....	.....	.....	Instr. curettage.....	8	Good.	
2	31	IV	.....	.....	.....	Instr. curettage.....	10	Fair.	
3	33	VII	3	.....	.....	Intr. douche.....	6	Good.	Refused curettage.
4	41	VII	1	.....	.....	Instr. curettage.....	9	Good.	
5	18	I	.....	5 days	104	Digital and Instr. curettage.....	12	Good.	First called 8th day.
6	25	III	.....	.....	.....	Intr. douche.....	3	Good.	
7	28	IV	.....	.....	.....	Instr. curettage.....	4	Good.	
8	10	II	.....	3 days	101	Instr. curettage.....	9	Good.	Bronchitis.
9	24	IV	2	2 days	101.4	Instr. curettage.....	8	Good.	
10	20	III	.....	.....	.....	Vaginal douche.....	2		Ovum expelled unruptured. Pt. up on 2d visit.
11	22	II	.....	.....	.....	Instr. curettage.....	7	Good.	
12	22	IV	.....	.....	.....	Finger curettage.....	7	Good.	
13	28	IV	.....	.....	.....	Instr. curettage.....	10	Anemic.	Severe hemorrhage.
14	31	V	1	.....	.....	Quinine and ergot administered.....	1	Good.	Refused local treatment.

Nine cases of abortion in the fourth, fifth, and sixth months:

No.	Age.	Para.	Month Gestation.	Previous Premature Delivery.	Fever Duration.	Highest Fever	Treatment.	Condition at Discharge	Day.	Remarks.
1	37	VI	4½	Instr. curett...	Good..	8	Placenta expressed. Placenta spontaneous incomplete. Up and about. Refused further attendance. Refused operation. Called in private physician.
2	24	II	5½	.....	2 days	101	Finger curett...	Good..	10
3	23	III	6	.....	.....	.....	Intr. douche...	Good..	9
4	31	VII	6½	.....	1	.....	Finger curett...	Good..	7
5	32	VI	4	3	Douches.	Good..	2	Refused operation. Called in private physician.
6	20	I	4	.....	3 days	102.4	Douches.	Fever.	3
7	23	III	4½	Ergot.....	Good..	5	
8	34	VII	4	3	.....	.....	Instr. curett...	Good..	8
9	27	.....	4½	.....	1 day	100.8	Instr. curett...	Good..	8

Seventeen cases of premature labor seventh, eighth and ninth months:

No.	Age.	Para.	Month of Gestation.	Previous Premature Delivery.	Days of Fever.	Highest Fever.	Complication.	Day of Discharge.	Child.	Remarks.
1	26	I	9	10	Living....	Induced, previous still birth. Rachitic, instrumental, etc.
2	42	VII	8½	2	.....	.....	.....	16	Living....
3	20	I	9	10	Living....	Induced-uremic convulsions.
4	19	I	9½	.....	.....	.....	.....	10	Still-born
5	27	IV	8	.....	.....	.....	.....	10	Still-born
6	35	II	9½	1	5	103.4	.....	14	Living....
7	26	I	9½	11	Living....	Aborted 2d day after onset of pneumonia
8	34	VII	8	.....	.....	.....	.....	9	Living....
9	28	V	9	.....	.....	.....	.....	10	Living....
10	28	VII	8	.....	3	102	.....	12	Macerated
11	34	VI	9	.....	.....	.....	.....	10	Living....
12	31	IV	8	1	13	105	Pneumonia	20	Still-born	
13	22	I	9	9	Living....	
14	24	V	9	.....	.....	.....	.....	10	Living....
15	34	VI	8½	.....	3	100.4	.....	14	Still-born
16	25	III	9	.....	.....	.....	.....	10	Still-born
17	23	II	9	13	Living....	

Temperature higher than 100.5 (mouth temperature) occurred during the puerperium in 76 cases or in 7.6 per cent. of all cases.

One hundred and thirty-one of the 1,000 cases or 13.1 per cent. were primiparæ. Of the 76 fever cases 19 or 25 per cent. were primiparæ.

Therefore the relative frequency of fever cases was almost twice as great among the primiparæ as among the multiparæ.

Ten of the 76 cases of fever occurred among the 38 cases of abortion.

CLASSIFICATION OF FEVER CASES BY CAUSES, WITH HIGHEST TEMPERATURES AND DURATION.

CAUSE OF FEVER.	Total Cases.	HIGHEST TEMPERATURE.					DURATION.			
		100.5 to 101.5	101.5 to 102.5	102.5 to 103.5	103.5 to 104.5	Over 104.5	1 Day.	2 to 4 Days.	5 to 8 Days.	More Than 8 Days.
Septic infection.....	18	3	4	4	5	2	..	8	6	4
Constipation.....	10	10	5	3	1	..	11	8	..	..
Reflex irritation from breasts	8	4	2	..	2	..	5	3	..	..
Rise of temperature, labor day only.....	13	10	1	2	..	..	13	..	..	..
Abscess of breast.....	2	..	..	..	1	1	..	..	..	2
Eclampsia.....	2	..	1	1	..	..	..	2	..	..
Hemorrhage.....	4	2	2	..	..	..	1	3	..	..
Hematoma of vulva.....	1	..	..	..	..	..	..	1	..	..
Non-septic diseases.....	6	1	2	1	2	..	..	2	1	3
Unknown cause.....	3	1	2	..	..	..	2	1	..	..
Total.....	76	31	20	11	11	3	32	28	7	9

In presenting this series of 1,000 cases, the author has submitted mere statistics with brief explanatory comment and in a few cases where the issue was fatal he has given more detailed reports.

Certain deductions from a general consideration of the work of the clinic during the four years of its existence may be of interest.

Students, graduate and undergraduate, can be utilized to great advantage in the treatment of these cases while they are acquiring experience in the work. Under proper restrictions and with a system of close surveillance by trained staff physicians, the use of students can be made a measure of as great safety and comfort to the patients as the average attendance of private practitioners. In the case of this particular class of patients most of whom would in the absence of some such means be delivered by midwives, there is a great gain in the treatment afforded by the out-door clinic.

A maternal mortality of two in 1,000 is low when it is considered that cases were accepted in emergency after acute crises had developed, and in many cases after the interference of midwives who had failed in the attempt at delivery.

Cases of septic infection were rare. Eighteen cases or 1.8 per cent. represents the occurrence of sepsis; 7.6 per cent. represents the occurrence of fever from all causes. Apparently the

tenement house, in spite of the squalor and filth, is at least as unlikely to furnish the germs of infection if a careful technique is used as the hospital where case follows case, even though in the hospital a more formal and perfect scheme of asepsis is possible.

Undoubtedly, however, the maternity hospital, with its large percentage of illegitimates, has patients whose personnel is more likely to present the predisposing causes of puerperal infection.

The general statement can safely be made that an out-door obstetrical service conducted by students under staff physicians' direction in the tenement houses will present a lower rate of fatalities, septic cases, etc. than either a maternity hospital or the general average of private practice. In comparison with hospital practice the difference is due to the less number of primiparæ and almost entire absence of cases out of wedlock. In private practice the higher abnormality record is due to the practitioner interfering more frequently out of deference to the patient's demand for the termination of labor or his own reasons for haste in leaving the case. The expression "average private practice" is used advisedly, for the author is cognizant of the fact that many excellent practitioners have long series of cases without any untoward complications.

But it is gratifying, at least, to consider that by means of an out-door free service, a safe scheme of obstetrical attendance is available to a large class who would otherwise for the most part secure only the midwives' aid.

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HEREDITY IN GYNECOLOGY.

BY

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THE problem of hereditary transmission of diseases of the female genital system has not been sufficiently studied. I have been unable, in spite of diligent search, to find any well-known monograph upon this subject. Problems of heredity of more general significance (I have not in mind the theories of heredity) are elaborated in pathology far more extensively.

For instance, we have positive clinical evidence of the hereditary transmission of syphilis, tuberculosis, hemophilia, the uric acid diathesis, physical disturbances, and alcoholism, in their direct or indirect forms. Are fibromata, cystomata, and genital malformations hereditary or not? These and similar questions are important. During the past year Simpson read before the Edinburgh Obstetrical Society a paper on the hereditary transmission of ovarian cysts. He mentions only one instance that came under his observation of multilocular cysts in a patient and in two of her daughters. He cites also similar cases of Lever, T. Simpson, Olshausen and others. All these cases were collected during half a century.

Turning over the text-books that I had at hand, I could find very little information upon this problem. Baldy speaks of hereditary transmission of cystomata in the following manner: "Several members of the same family have been affected." Slaviansky remarks: "At the present time we can speak of heredity in ovarian cysts in the sense that they are observed developing in sisters." Other authors (Kelly, B. Sutton, Hirst) are silent concerning this matter.

As to the influence of heredity in relation to fibromata, few remarks are to be found. E. C. Dudley says: "Heredity is a strong etiological factor." Veit expresses a less positive opinion: "It appears, however, that heredity plays a rôle therein."

Of hereditary transmission in cancer of the uterus K. Schroeder speaks doubtfully. Dudley has a more firm conviction. He says: "The influence of heredity as a cause, though difficult to estimate, is considerable." A. Courty acknowledges the influence of heredity in these cases when he says: "It is not to be denied that cancer, in general, and its localization in the uterus, particularly, are hereditary." The same author says of the heredity of leucorrhea: "I have found in certain girls granulations and leucorrhea, which I had observed in their mothers," and he adds: "But it is to be recognized that the influence of heredity, and especially that of direct heredity, seems to be neither frequent nor fully demonstrated."

All these quotations refer to direct heredity, direct in the sense of transmission of pathological phenomena of the same kind; but there is another aspect of this problem, I mean the transmission of pathological conditions which lead to the development of certain ⁷malformations. Thus, we know that

syphilis is transmitted not only as such, but that it manifests itself in the offspring in different ways, as has been perfectly demonstrated in the interesting work of E. Fournier (*Stigmates dystrophiques de l'Hérédo-syphilis*). In this the facts concerning the subject are diligently collected and excellently worked out. According to this author, these dystrophies of hereditary syphilis, as he names various malformations which he observed, affect nearly all parts of the body. The cause is the action of the specific syphilitic poison on the embryo. Fournier supports this hypothesis by citing the experiments of Pouchet, Hertwig and others upon the development of the ova of the sea-urchin (*Strongylocentrotus lividus*) and of the frog, when placed in unsuitable media. Some observations have been made upon the eggs of hens and ducks, submitted to unilateral heating.

These doubtful problems of heredity have been still less studied in their relation to gynecology, and not one of the text-books which I have examined deals with them, though it is almost evident that such dystrophies should be found in the female genitals as well as in other parts of the body, because during their development they are under the same conditions as other organs. If one admits, as Fournier does, that the syphilitic poison acts upon certain organs, there can be no reason to deny similar action on other organs.

I have collected some cases that may serve to elucidate certain of these problems of heredity in gynecology.

The first two cases illustrate the influence of hereditary syphilis on malformations, or rather the coexistence of hereditary syphilis and genital malformations. In both cases we have to deal with congenital antelexion with conical cervix.

CASE I.—Sh., aged 25 years. Complains of sterility. Married four years. Last menstruation, two days, scanty, painless. Moderate leucorrhœa. Well-marked dental erosions. Father syphilitic. Diagnosis: antelexion of the uterus, conical cervix.

CASE II.—P., aged 24 years, virgin. Complains of pain in the left groin. Menstruation profuse, painless. Father had a syphilitic infection (verified by the brother of the patient, a physician). Diagnosis: antelexion of the uterus, conical cervix, left oöphoritis.

If one admits that the syphilitic poison can influence the embryo so as to produce constant lesions, there arises the question whether there are other poisons which may act on

the embryo in a similar manner. E. Fournier gives an affirmative answer to this question. Among such agents are tuberculosis, malaria, lead and other poisons.

Now, if it is supposed that fibromata result from abnormal embryonal development, and that such a development, in its turn, results from the action of a toxin during intrauterine life, why should we not consider the tuberculous toxin as such an agent? If so, let us see these two cases.

CASE III.—Mrs. B., aged 24 years. Complains of menorrhagia. Married one and a-half years. Sterile. Menstruation profuse. Slight leucorrhœa. Tuberculosis in the families of both parents. Mother suffered from fibromata. The father's sister also had a fibroma of the uterus. Diagnosis: uterine fibromyoma.

CASE IV.—Mrs. D., aged 43 years. Complains of pains in the groins and back and metrorrhagia. Married fourteen years, sterile. Menstruation always profuse, especially so for the last two years. Leucorrhœa without odor, not profuse. Frequent urination. Father tuberculous. In childhood the patient was scrofulous. Diagnosis: fibromyoma.

It is a well-known fact that scrofulous children are subject to epistaxis resulting from nasal polypi. Have we not the right to suppose that the same cause produces the hyperplasia of the uterine mucosa, which leads to metrorrhagia and menorrhagia?

At this moment I have not at my disposal histories of girls or women who were not pregnant. Such histories would best illustrate the above hypothesis. The following two cases are not without interest.

CASE V.—Mrs. T., aged 32. Complains of menorrhagia. Married fifteen years. Had three children, the last ten years ago. Menstruation profuse, four weekly, duration 8 days. In childhood, scrofulous. Brother and sister died from tuberculosis. Nothing known about parents. Diagnosis: endometritis.

CASE VI.—Mrs. F., aged 30 years. Complains of abundant and frequent menstruation. Married ten years; two children, last six years ago (twins). Leucorrhœa. In childhood was scrofulous. Catarrh of the apex of the lung was diagnosticated thirteen years ago. The mother had twelve children. Father, tuberculous. Diagnosis: endometritis.

In the next three histories I intend to show a correlation between tuberculous heredity and affection of the right appendages, which I have quite frequently observed, and which still

remains not quite clear to me. A salpingo-oöphoritis of the right side manifests itself only by localized pain. When these patients complain of pain in the groin, and are asked, "In which groin?" they answer without hesitation, "In the right one." And when questioned as to whether the left one does not also hurt, they answer "No," or "It begins to hurt." Even if we have to deal with a case of dysmenorrhea, the pain also is localized in the right side, or has commenced there, moving to the left side only in later years. It is also very astonishing that if such a patient acquires a gonorrheal infection the right appendages are first affected. It is not uncommon for such patients to have a characteristic appearance. They are more elegant and slender than the average patient, so they may be recognized at a glance. The eyes are prominent—like those of dolls or of wax figures. I would even call them "wax-figure or doll eyes," so very characteristic are they. Such eyes are common not only among the wealthy classes, but also among peasants. The forehead is prominent. The outline of the forehead gives the face a particularly intelligent appearance. These patients resemble children with hereditary scrofula.

If this observation is not wrong what does a correlation signify? In this connection I would call attention to the relation of appendicitis to tuberculosis.

At the last tuberculosis congress in Paris, Dr. Chavannaz said: "Les rapports entre la tuberculose et les manifestations appendiculaires sont multiples." These words are applicable, too, in the sense that appendicitis occurs in persons with tuberculous heredity, as is shown by this case.

CASE VII.—Mrs. K., aged 27 years. Complaints of pains in the cecal region. Married nine years. Sterile. Menstruation, with pain in the right groin. Four years ago had an attack of appendicular colic, a second two years ago, and a third within the last two months. Suffers from night sweats. Father tuberculous. Diagnosis: appendicitis.

The connection between tuberculous heredity and affection of the appendix is more or less comprehensible, because it is well known that the appendix is rich in lymphatic tissue, and even, "it resembles the tonsils in its abundant lymphoid tissue." Further we know that persons tuberculous by heredity are disposed to adenopathies of the most diverse kinds, and thus the inflammation of the appendix is a single type among the

different adenopathies, to which such patients are subject. Affections of the appendix are met with most often between 10 and 30 years (Kelly), a fact that this author explains by the existence of "the well-recognized susceptibility of lymphoid tissues to infections during early life." In the same manner the symptoms of affection of the right appendages manifest themselves at this age. Thus, as we see, the tuberculous heredity and the same age are common to both. There are two possibilities which may explain this observation. Either the cause lies in conditions of blood and lymph circulation, common to both, or the right appendages become infected from the appendix, which harbors bacteria. In acute cases, such a transmission of infection is often seen. Such a case has recently been published by Bland Sutton in the *British Medical Journal* (Acute Salpingitis, Caused by an Inflamed Appendix). The following three cases illustrate this observation.

CASE VIII.—Mrs. S., aged 30 years, complains of pain in the right groin. Married thirteen years. The first year had a miscarriage at two months, followed by an acute metritis, which lasted four months. Three years later the right groin became painful. Menstruation scanty, two and a-half weekly, duration two days. Has chills. Scrofulous in childhood. Mother tuberculous. Diagnosis: salpingitis, right side.

If we suppose that the infection proceeded from the uterus, it is particularly to be noted that it is the right appendages that became affected.

CASE IX.—Mrs. J., aged 30 years. Complains of pain in the right groin. Married thirteen years, four children, the last three years ago. Menstruation profuse, twice in month. Scanty, yellowish vaginal discharge. Pains in the groin only for the last two years. Night sweats, cough. Scrofulous in childhood. Pleurisy five years ago. Husband has chronic gonorrheal urethritis. Diagnosis: bilateral salpingitis.

In this case nothing is said about heredity, but it seems to me that the chronically diseased respiratory tract, the night sweats and the pleurisy and scrofula in the past gives us sufficient right to suppose a tuberculous heredity. If so, it is worthy of note that the patient complained of pains in the right groin, though both appendages were affected; this peculiarity I wish particularly to point out.

CASE X.—Mrs. D., aged 38 years, complains of pains in the

right groin and sacrum. Married eighteen years, four children, the last eleven years ago, followed by acute metritis. Menstruation profuse, three-weekly, duration three days. Father died from tuberculosis at the age of 42. Mother has chronic pneumonia; brother tuberculous. Diagnosis: chronic metritis.

In *Annales de Gynécologie et d'Obstétrique* (May, 1905) I published a case of dermoid and there made the assumption that a patient with a dermoid or embryoma is a case of a twin pregnancy. I saw a basis for this supposition in the fact that the mother of the patient had thirteen pregnancies, two of which were of twins, and moreover the patient herself was one of these twins. Besides, in the article mentioned, I pointed out that more attention should be paid to the relation between the generative faculty of the mother and any pathological deviations of the daughter, as it is not to be doubted that there is a connection.*

Concerning this question I had not the chance to deal with a case of dermoid, with a history of twin pregnancy, but there is a case which testifies that "the mothers of patients with dermoids have a well-marked generative faculty."

CASE XI.—Mrs. M., 21 years, complains of pains in the abdomen. Married two and a-half years, one child one and a-half years ago, followed by puerperal fever. Menstruation normal. One and a-half months ago had an attack of acute pain in the left groin. A second attack two weeks later. Mother had thirteen pregnancies. Diagnosis: dermoid.

With respect to twin pregnancy I report the two following cases:

CASE XII.—Mrs. O., aged 37 years. Complains of tumor in the abdomen. Married eighteen years; nine children. The last, two years ago, were twins. Menstruation normal. Profuse leucorrhea. Some months feels a tumefaction in the abdomen. Diagnosis: ovarian cyst.

CASE XIII.—Mrs. P., aged 26 years, complains of pain in the abdomen. Married twelve years; seven children, of which the last were twins. Mother had thirteen pregnancies, among

*This article was abstracted in the October number (1905) of this journal. Two points were inexact. (1) It is said: "Embryomata have been found in the testicles of the male, a fact which favors the theory of parthenogenesis." This should have read: "a fact which opposes the theory of parthenogenesis." (2) "Those cysts do not become carcinomatous." I do not deny the possibility of such a degeneration. I only said that I did not find such a degeneration in the fifty-three cases which I had examined.

them one twin pregnancy. Diagnosis: bilateral salpingitis, and ovarian cyst.

These histories show the coexistence of cystomata and of the tendency to twin pregnancy; and Case XIII shows an example of hereditary transmission of this property.

As concerns direct heredity, I have only Case III of bilateral fibromatous heredity, that ended, let us say, in a fibroma.

These cases are too few to draw definite conclusions. In this paper my only wish is to point out that the problem of heredity and the value of hereditary influence in gynecology should attract more attention than it has in the past.

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JUDGMENT AND TECHNIQUE DURING LABOR.*

BY

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It has often been declared by those who are inclined to trust all to nature that labor being a natural act, does not require the interference of art for either its promotion or its accomplishment; and, consequently, that when this becomes necessary, it forms an exception to the rule. This view of the subject, I am sorry to say, has had many followers; and has, from its influence, retarded, more perhaps than any other circumstances, the progress of improvement in this most important branch of medical science. It so entirely comports with the theories of the fastidious admirers of nature; it so completely coincides with the feelings of those whose supineness makes them adverse to inquiry; so effectually apologizes for ignorance; and so plausibly lessens the evils arising from neglect or the want of the

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proper and judicious application of skill, as to secure in its favor at the present day not a few followers. Errors in premises must almost necessarily lead to errors in deduction; hence the too exclusive reliance on the powers of nature to overcome all the obstacles connected with parturition, and the almost total disregard of the first and most important principles in the art of obstetrics. These errors originated in ignorance; and were perhaps at first excusable from this cause; but how reprehensible do they become now, since the powers of nature are better calculated, and the resources of the art better understood! In what light, then, should we view writers who still inculcate such doctrines, physicians who make the whole art of midwifery consist in doing nothing!

Were the constitutional powers of the system, the physical conformation of the pelvis, and the size of the child's head always the same; were the most favorable presentation of the child, the best construction, the most healthy play of the powers concerned in this operation, never assailed by accident or complicated by disease, the opinions of those who contend for the supremacy of unassisted nature would deserve much, and perhaps exclusive attention. But, as it is too well known that this never has been nor ever can be the case, I must insist that the powers of nature have their limits and that the interference of art sometimes becomes absolutely necessary.

I am very far from wishing to be understood as advocating the indiscriminate interference of art during the progress of a healthy labor. This is the very reverse of my opinion and of my practice. I wish merely to insist that nature is not competent in all exigencies, for in many instances, when she is permitted to proceed without interruption, and is evidently able to effect her object, the sufferings of the patient might probably have been much abridged by the exercise of judgment and the judicious aid of the skilled obstetrician.

If this be true in the most healthy or practicable labors, how much more important does the judicious and timely application of proper aid become, when it is well known that the deviations from healthy power and structure are almost constant in their occurrence, and almost infinite in their variety. It is the knowledge of these changes and the mode of rectifying them when necessary that emphatically declare obstetrics to be a science, for it has and must have its principles, principles that

must be not only known in the abstract but constantly employed. It is the happy application of the fundamental rules of this science that makes one physician superior to another.

Too much importance may easily be attached to experience alone. Though it is essential to the successful exercise of the profession, it becomes decidedly useful in difficult cases only when it is based upon the fundamental principles of obstetrics. If the physician be ignorant of all that is essential to be known of the well-formed and the diseased pelvis, or unacquainted with the various ways the head may pass through it, he will be totally incompetent to act when there is any material deviation from the healthy economy of labor. He may rashly suppose there is no alternative but to resort to a major obstetrical operation where judgment and skill might immediately relieve the patient by rectifying the error in presentation. Or he may negligently and reprehensibly wait for the successful operation of nature until the patient expires, where nothing but judicious and prompt interference can save. There is no error into which the man of mere experience may not run.

Many pursue the safer plan in submitting the case to nature; for in many cases of desperate appearances she successfully surmounts the difficulties. But this is only submitting to a choice of evils; while the well-instructed physician would triumph over them. That in many instances we should be the silent observers of Nature, is unhesitatingly acknowledged; but it requires no less judgment to determine when we should be so than when it is proper to offer assistance or to take the business entirely out of her hands. But the decisions of ignorance do not always result in an entire reliance upon the powers of Nature; they sometimes, and too frequently, end in the contrary extreme. In this case there is an overweening desire to aid her efforts, and these ill-directed endeavors soon eventuate in a destructive subversion of her powers. There is no one circumstance that so largely and certainly contributes to divert Nature from her proper course as the persuasion that art can benefit her under all circumstances and at all times. Unfortunately for the interest of humanity, it requires more knowledge not to be officious than falls to the share of many of those who pretend to practise obstetrics. It is a vulgar prejudice that great and constant benefit can be derived from the agency of the physician, especially during the active state of pain, and this feeling is but

too often encouraged by the ignorant and designing to the injury of the patient and to the disgrace of the profession.

To conduct a labor with safety, the physician should be well acquainted with its phenomena, the order or succession of them; be able to decide when certain of them are wanting, or when others are in excess, to estimate the relative or positive importance of such, the force or effect of each pain, the necessity of preserving or wasting the waters, the degree of resistance the os uteri or external parts may offer, the situation of the former as regards the presenting part, the certainty of the presentation, the mode of rectifying any error of presentation in proper time, the capability of doing this with the greatest advantage to the patient and to the infant, and he should be able to pursue a firm, candid, and feeling conduct throughout the whole scene; that he may not be betrayed into indiscretion by the overweening anxiety of the friends of the patient; that he may not lose the important moment to act, from an apprehension that blame may attach upon the disclosure of its necessity, and that the sufferer may derive every advantage his kindness and sympathy can afford. She is entitled to all the consolation a well-grounded assurance of a happy termination of her sufferings can afford, yet she must not be betrayed into false hopes by an ill-judged promise of speedy issue, when the period is remote. No conversation should be indulged in that might for an instant excite her apprehension; conversation should be cheerful and free from the idle discussions of danger in similar situations, and it must be as void of levity as of gloom.

Let all communications to the patient of a delicate nature be conducted through the medium of the nurse. Endeavor, by a general and well-chosen conversation, to divert the patient's mind as much as possible from the purpose of the visit, when one's services are not immediately needed. When one's presence is not absolutely necessary in the sick-room, one should be as little in it as will be consistent with duty; by this we remove constraint, and the period of watching is apparently abridged. If, after making the examination, one is importuned for an opinion of the nature of the presentation and the duration of the labor, one should not commit oneself by any positive declaration, unless certain of the first, and pretty sure of the latter. Before proceeding to the examination let the patient be placed with the most scrupulous regard to delicacy, and refrain from using unnecessary force in the examination.

The patient should be forbidden everything which might excite the nervous or circulatory system; she should be prohibited wines or any other liquors unless they are indicated as a stimulant. And the custom of obliging her to walk the floor continuously, with a view to increasing the pains, should be positively forbidden. This only hastens exhaustion, and forces her to give up strength which should be retained for the second stage of labor. When the patient is about to be placed for labor, the physician should withdraw. While the nurse is preparing the bed and patient, he should make every effort to render his hands and arms as aseptic as possible by using plenty of soap and hot water, with a nail-brush, afterwards immersing them in 1-1000 bichloride solution and applying sterilized rubber gloves. This should be done previous to every examination. Meanwhile, the external parts, the inner surface of thighs and abdomen of the patient should have been cleansed thoroughly. Inquiry should be made about the state of bowels; fecal impaction should be removed by enema. Her linen should be so placed as to be out of danger of becoming soiled by the discharges; her gown should be without shoulder-straps that it may be easily removed.

The bed should be so arranged as to preserve it with certainty from the discharges. For this purpose, a thick blanket should be folded several times and placed beneath the under sheet, at the part of the bed on which the patient will permanently lie; a sheet as often folded should be placed over the under sheet, so as to correspond with the blanket below; on this she will be placed after delivery. A temporary or delivery pad should consist of a blanket, lined with rubber, covered with a small folded sheet. She should be covered entirely, except her head; if in winter, by a blanket; if in summer, a sheet will be sufficient. I always direct the nurse to cover the genitals with a hot bichloride gauze pad, 1-1000 solution, to be removed as soon as soiled or if it begins to cool. It is easy for the vaginal walls to become infected from without, and if the surgeon is justified in protecting his wound with an aseptic dressing to prevent infection, it is certainly the duty of the obstetrician to do likewise.

After ascertaining the exact position of the child's head and condition of the mother's pelvis, in reference to its formation, and if labor is progressing, she and her family should

be assured of the fact. Beware of officious and unnecessary examination, for by frequent and incautious touching the glands are overstimulated. In this case, the secretions cease and the parts become tender and swollen, especially the os uteri, should it not be fully dilated. Nature's barrier is broken down, thereby allowing an entrance for infection; the patient becomes restless in the intervals of the pains, fever is excited, and the patient begins to lose confidence in the attendant.

Should the pains be efficient, the os uteri well dilated and the membranes entire, let them be ruptured by the pressure of the finger against them, or by cutting them with the finger nail. This should be done for the following reasons: When the mouth of the uterus is completely dilated, the membranes have completed their function. Very often the advance of the presenting part is retarded by their strength. Frequently the pains are increased both in force and frequency when the membranes are ruptured. It gives much greater security to the patient after delivery, by permitting the tonic contraction to begin before the second stage is completed, thus insuring a more speedy delivery of the placenta and lessening the risk of hemorrhage.

When the head is emerging from under the arch of the pubes, the perineum should be carefully supported by placing the palm of the right hand, with a folded sterilized towel interposed against it, making counter-pressure when necessary, until one is satisfied that the perineum is sufficiently relaxed.

Artificial rotation of the head should not, under any circumstances, be resorted to under the pretense of hastening the delivery of the shoulders. If the condition of the child will permit, and in almost all cases it will, let nature do the rotation, for speedy delivery of the shoulders by grasping the head and making forcible rotation and traction, is often the cause of laceration of the perineum. The thin and weakened perineum should be guarded just as diligently during the passage of the shoulders as during the exit of the head. All methods of preserving the perineum aim at one thing, and that is to relieve it of as much pressure as possible, either by counter-pressure, forcing the occiput or presenting part as close to the arch of pubes as possible, or by guarding against forcible exit.

After having separated the child from its mother, it should be given to the nurse and removed from the bedside. Before

attempting to deliver the placenta one should ascertain the condition of the uterus by examining it through the parietes of the abdomen. This organ will be found to be either contracted or partly contracted. If the former, the placenta may be delivered, provided it be loose in the vagina, by tightening the cord with the left hand and tracing it with the forefinger of the right to the placenta, which is to be hooked with the introduced finger, and gently drawn downward and backward with the other hand until it begins to pass through the vulva. It should then be grasped with both hands and given several twirls to twist the membranes, that they may be entirely withdrawn from the uterus. If, on the contrary, after waiting a reasonable time, a slowly contracting uterus is found, with an adherent or retained placenta within its cavity, one should resort to Credé's method of placental expression, remembering that great force is never necessary to carry out this method. When the placenta is delivered, it should be placed in a basin, and carefully examined, to see if any portion of the same is missing.

After a short wait, the abdomen should again be examined. Should the uterus be flaccid, brisk friction with the open hand, or Credé's method, will nearly always force it to contract. At the moment, perhaps, there may be a sudden discharge of coagula from the vagina, accompanied by some pain, which very frequently alarms the patient, but she should be assured that the discharge is natural, as it is proof that the uterus is contracting. This friction should be kept up until the uterus becomes hard and appears to be disposed to retire within the pelvic cavity.

After noting the general condition of the patient, and finding the same to be good, cautiously examining for tears and repairing them if found, we should assure the patient that her labor is over, and that by careful obedience to the advice of her physician and nurse her recovery will soon be complete.

In closing, let me say we should remember that in no function of the human system does nature try to perform her duty more perfectly than in the birth of an offspring. It should be a natural, physiological act, and for this reason alone, I claim it is a time in each woman's life when nothing should interfere with us in bringing her mind and body to that normal state, which is so necessary for Nature's guide. Call it a serious time

of life with every woman, if you wish, for so many parturient women have previously lived such artificial lives that natural physiological tendencies have long ceased to be the functions of the different organs of their bodies.

1921 I STREET, N. W.

CLASSIFICATIONS OF THE NON-SPECIFIC SURGICAL FEVERS.*

BY

WILLIAM M. FORD, M.D.

I. Nonmicrobic—Fermentative Toxemia.

II. Microbic	1. Intoxications	a. Passive Sapremia.
		b. Passive Septicemia.
	2. Infections	a. Active Septicemia.
		b. Active Sapremia.
		c. Pyemia.

IN presenting this paper nothing will be attempted beyond an effort by its author to bring to your attention an intelligent classification of the nonspecific surgical fevers with which we are constantly brought into contact, based on a rational consideration of the etiological factors believed to be active in each instance. A search of the literature revealed such varied, incomplete and incompatible, if not incomprehensible classifications, all based on the same premises of zymotic and bacteriological etiology that I will not offer to you the conflicting conclusions reached by many of our best writers.

The term nonspecific fevers as used in this paper is intended to cover those conditions of increased metabolism due to fermentation or bacterial agencies which are not directly associated with any specific diseases. Under this heading we will consider the following conditions: Aseptic traumatic fever, sapremia, septicemia, both active and passive, pyemia, and mixed conditions. The importance of a clear conception of the causation is readily appreciated when we consider that it is only by differentiation that we are enabled to give a prognosis which approaches accuracy or to outline a plan of treatment which subserves the demands of modern and scientific medicine. The

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widespread occurrence of these conditions in the fields of both the gynecologist and the surgeon lends to the subject a peculiar interest quite apart from its scientific attractiveness.

The first, *aseptic traumatic* or *aseptic surgical fever* we will define as a febrile disturbance which follows closely (sometimes without interval), but which is quite distinct from, the reactionary fever of nervous origin. It often follows the shock of a surgical procedure, a traumatism, the passage of a sound or normal parturition. It is due to the toxic action of absorbed leucomains and albumoses generated by the fermentation of the extravasated blood and damaged tissues within the living being. These agents in themselves are sufficiently active to disturb the thermotactic center to that degree necessary to produce the usually mild but occasionally lethal symptoms that we are accustomed to find. It is a true autointoxication and a specific analogy is found when a snake dies from the effect of an injection of a self-generated venom.

The symptomatology is characterized constitutionally by slight headache, moderately elevated temperature (99.5-101), and correspondingly rapid pulse and respiration; and locally by a cutaneous discoloration varying from purple to yellow if the injury is superficial. The signs and symptoms become manifest at the end of twenty-four hours, and then gradually subside from two to seven days, depending, of course, upon the extent and site of the involved areas.

The prognosis is good except when the injury is exceedingly severe, as instanced in abdominal cases which recover from shock and which terminate fatally in thirty-six or forty-eight hours. These cases not infrequently manifest a temperature above 105° and a pulse and respiration proportionately accelerated yet neither the gross lesions found at necropsy nor the laboratory findings yield positive evidence of bacteriological invasion.

As a rule no treatment is required. When active interference is demanded and hydragogue cathartics have proved without avail, the removal of the offending agent by evacuation of a large hematoma or clots from the peritoneum or of retained secundines from the uterus, and the establishment of free drainage, are usually followed by marked improvement. Other general measures directed to the support of the patient are useful. The grave cases of this class are proportionately as rare as the prognosis is usually good.

The second state to which your attention is asked is designated as *passive sapremia* (putrid blood). When the bacteria of decay gain access to a suitable culture medium they proliferate and elaborate ptomaines of variable toxicity. When invasion by these germs of tissues possessing little or no vitality takes place, neighboring blood-vessels and lymphatics are quick to absorb these putrid products, particularly when drainage is imperfect. This absorption continues until demarkation is established by granulation tissue or the offending part is removed. The condition is most frequently encountered in persons suffering from gangrene essentially of the moist variety and in parturient women in whom retained membranes are putrefying. A medical parallel is found in the ptomain poisoning of alimentary origin.

The symptoms of the lesions unfortunately are not unique. A chilly sensation, occurring twenty-four hours after the possibility of invasion, and a gradual rise in temperature, the maximum of which varies from 102° to 105° and is reached about the third day, accompanied by the usual reaction associated with such a febrile movement constitute the clinical picture. It must be remembered that the fever is continued, for the absorption of the poison is constant. Locally, a foul-smelling sloughing area is found. The prognosis is good in well-treated cases seen early. Briefly the treatment consists in removing the source of toxic absorption and fortifying the patient, that he may better combat the ptomaines already absorbed. Prompt amputation of a gangrenous limb, extirpation of a sloughing wound and free drainage, or the removal of fetal membranes coupled with free catharsis and stimulation of the heart and kidneys usually suffice to bring about a favorable termination.

Under the head *septicemia* we will have to do with two varieties, the *passive*, a blood intoxication, and the *active*, a blood infection. The former is due to the absorption by the circulation of the products generated by the ordinary nonspecific organisms competent to produce pus, but not of the organisms themselves. Besides the ordinary bacteria common to suppurating wounds, the streptococcus and staphylococcus pyogenes the bacillus pyocyaneus, etc., the bacillus coli communis and certain animal organisms are occasionally found at the exciting focus.

To detail the symptoms of this condition would be to weary

you with the constitutional manifestations of abscess, suppurating wounds, erysipelas and a host of similar conditions all dependent upon a common cause, namely, the absorption through the lymphatic channels certainly, and through the neighboring blood-vessels possibly, of the toxins and toxalbumins above referred to, from a more or less circumscribed area.

The prognosis, usually good, is dependent upon the resistance of the patient and the success achieved in our efforts to inhibit further intoxication.

The treatment, generally speaking, consists in free drainage, free catharsis, and the free use of hydrotherapy.

Vastly more important, but fortunately less frequent than the foregoing, is *active septicemia*, a condition characterized by the presence in the blood stream of the organisms and their products mentioned under the immediately preceding caption. The offending agents may gain access to the circulation by the extension of passive septicemia, provided Nature's pyophylactic membrane of embryonic granulation tissue is inadequate, or they may gain entrance through the open ends of thrombosed veins, particularly of the parturient uterus, through the openings of pin pricks, through the wound of an operative field which perchance has healed by first intention, or lastly, in a few instances by avenues impossible of determination.

If the observations of some recent French authors are authenticated, to the effect that the staphylococcus pyogenes exists in the blood stream of some apparently healthy adults, and if the bacillus of tetanus* has lain dormant in the healed wound of a German army officer for two and one-half years before producing untoward effects, is it unreasonable to suppose that in these so-called cryptogenic cases the offending germ has found access at some remote date when a trifling or long-since forgotten wound was sustained, and has remained quiescent until the tissue tension was sufficiently lowered to permit it to again return to its natural and vicious activities?

Theoretically, *active sapremia* deserves separate discussion, practically it is rare, and clinically it is not easily distinguished from active septicemia, therefore with a note on its etiological difference, to the effect that it is due to the presence in the circulation of the bacteria of decay and their products, I will group the two conditions together.

*J. B. Bissell. Tetanus. *Phil. Med. Jour.*, Feb. 16, 1901.

The incubation period varies from ten hours to three days, during which vague prodromes of infection may be manifested. The invasion is marked by one unrepeatd chill, high temperature, at times remittent but usually continued, typhoidal euphoria, which is followed by delirium, coma and death in four days, in acute cases; in those which become chronic the condition persists for weeks and occasionally months. Gradually the thermal range assumes a tertian malarial character and in these cases a favorable outcome may be anticipated. The post-mortem findings often reveal malignant endocarditis, enlarged spleen, petechial hemorrhages, and dark-colored blood of diminished coagulability. One point worth remembering is that with each cycle of reproduction there is an exacerbation of the disease, and when many germs reproduce synchronously, a malarial condition may be simulated.

Acute cases are uniformly fatal; in those which become chronic, the prognosis improves with the chronicity. Those which survive the fourth week usually recover.

The treatment is sustaining and symptomatic. The cleansing of an infected wound is of little value *per se*, as the infection is already beyond its environs. The most that can be expected is that it will eradicate a synergistic intoxication. Hydrotherapy is of value in stimulating heart and emunctories and in diluting the toxins in the blood. It is lamentable that the antistreptococcic serum prepared by the prominent manufacturing chemists is of little or no value, probably because it consists of zozins and phylaxins antagonistic to the streptococcus pyogenes alone, whereas the condition usually encountered is a mixed infection.

Lastly, *pyemia*. This, is a febrile disease, characterized pathologically by the presence in the blood-vessels of a septic and disintegrating embolus which causes irregular metastatic abscesses particularly in the viscera. It may result from the extension of an active or passive septicemia, *i. e.*, appendicular inflammation; it may follow aseptic traumatic fever, to wit, a compound fracture when the sinuses and diploe are imperfectly closed; or it may complicate a sapremia in which active interference has been too long delayed, as witnessed in an ulcer of the stomach or retained secundines. Adult males appear to be most often afflicted. Thus far all reported cases have been associated with an open wound. The streptococcus pyogenes is usually the exciting cause.

Clinically, about ten days subsequent to the receipt of the predisposing trauma a distinct rigor is followed in turn by a high fever and profuse sweat with remission of symptoms. If the area involved is near the surface, a focus of suppuration is next observed. After an interval of variable length, hours or weeks, a repetition of the symptoms occurs, but whether the course is acute or chronic, the chills, fevers, and sweats recur with increasing frequency; marked toxemia, hematogenous jaundice, cutaneous hyperesthesia, mown-hay breath, and great emaciation all point to a fatal outcome. The duration of the affliction varies from five days to as many weary months. Each chill, fever, and sweat marks the lodgment of an embolus in a new situation. That the spleen is but slightly enlarged and that the patient's mind remains clear are features worthy of note. The prognosis is fatal.

When practicable, treatment should be promptly directed to the source of infection. The high proximal ligation of the thrombosed vessel followed by eradication of the vessel and clot and asepticization of the wound is of prime importance. Metastatic foci should be similarly treated when within reach (usually the liver, the lungs, and viscera beyond our reach are attacked, hence the hopelessness of ultimate cure). These measures are supplemented by those indicated for septicemia.

It is of course understood that as the predisposing and exciting causes of many of these conditions are identical; they may be and commonly are associated, in which case new perplexities are added to the situation. But care in making a differential diagnosis of these confused conditions, all too often designated by that vague and conveniently comprehensive term sepsis, will be fully compensated for by the satisfaction that accurate knowledge gives the diagnostician, the outline for treatment it affords the practitioner, and the opportunity of making a rational prognosis it offers to the scientific physician.

To summarize:

Aseptic traumatic fever, due to absorption of substances little altered from normal tissues from a sterile wound.

Passive sapremia, due to absorption of bacterial proteids and ptomains elaborated by bacteria of decay in a putrid wound.

Passive septicemia, due to absorption of ptomains and toxalbumins elaborated by germs of suppuration in an area of suppuration.

Active sapremia, due to toxic elaborations of decay germs in the circulation.

Active septicemia, due to toxic elaborations of bacteria of suppuration in the circulation; no local inflammation essential.

Pyemia due to presence of a septic embolus in the circulation; characterized by metastatic abscesses.

MENSTRUATION—ITS SIGNIFICANCE, WITH PARTICULAR REFERENCE TO RECENT LITERATURE.*

BY

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THE phenomenon of menstruation, since the time of Aristotle, has been the subject of much speculation and is still a question for research. Its cause is yet undetermined.

Tait believed that menstruation was dependent upon an influence emanating from the oviducts, but that ovulation and menstruation were independent functions. Byron Robinson affirms the phenomenon is governed by nerve ganglia located in the walls of the uterus and oviducts. Joseph Raymond believes the utility of menstruation is "the secretion of fluid to float an egg into the uterus. Its design is reproduction." According to Raymond, "menstruation is due to a nervous mechanism, termed automatic ganglia, located in the walls of the uterus and oviducts."

Investigators of recent years are practically agreed that the menstrual discharge contains mucus, blood, epithelial cells, leucocytes and not infrequently connective tissue cells from the uterine mucosa. They also agree that the extent of tissue destruction is subject to great variation, not only in different individuals, but in the same female at her different menstrual periods. A point at issue is the interpretation of the loss of epithelial tissue. Clinicians, as a rule, believe the loss of epithelium to be a mechanical one, due to uterine congestion and intrauterine hemorrhage, which mechanically carries away the epithelial cells. A few even affirm that the

*Read before the Southern District of the Chicago Medical Society, November 16, 1905.

normal menstrual discharge does not contain epithelial cells. When one bears in mind that epithelium exfoliates normally and regularly, wherever it is found, the latter assertion becomes untenable.

In support of the view that only a small portion of the uterine epithelium is lost and that this is purely accidental are the observations of Moricke, Strassman, Findley, Williams, Gebhart, Mandel, Leopold and Merdevort. On the other hand, Engelmann, Kundrat, Heape, Marshall, Minot and others affirm that the loss of epithelium involves intrinsic pathological changes, and is therefore not to be explained as a mere mechanical exfoliation.

In the case of woman, the methods pursued by these authors are: microscopic examinations of the menstrual discharge; curettements of the menstruating uterus, and section of menstruating uteri received as fresh as possible and preserved in the best hardening fluids, preferably Zenker's fluid.

Research in recent years on the estrous cycle in animal females promises fruitful results and sheds some light on the phenomena of menstruation in woman. The literature on the relation of menstruation to the estrous cycle is too voluminous to be detailed here. In support of the view that the phenomena are the same, I will merely give the summary of evidence, as offered by Heape (1900):

"1—There is congestion of the generative organs during both menstruation and 'heat'.

"2—There may be a recurrence of 'heat' as there is a recurrence of menstruation.

"3—The discharge during 'heat' may be of a menstrual character.

"4—From a phylogenetic point of view the analogy is to be expected."

During the proestrous cycle of all animal females there is a uterine mucous discharge which contains epithelial cells and leucocytes, and there is practically always a hemorrhage into the uterine cavity. The blood may or may not appear in the external discharge. It frequently does.

The most recent and scientific publication on this subject is that of Marshall (1904) on the estrous cycle in the common ferret. Marshall divides the changes in the non-pregnant uterus of the ferret into four periods:

1. Period of rest.
2. Period of growth.

3. Period of degeneration.

4. Period of recuperation.

His conclusions are that—

“The first period corresponds to the anestrus, during which the uterus is in the normal state. This is followed by the growth period, during which the uterine cavity becomes reduced to about half its size, while the mucosa is correspondingly thickened. Meanwhile the blood-vessels become much congested and subsequently break down, thus making the commencement of the period of degeneration. The blood corpuscles become scattered in considerable numbers in the stroma, and eventually in the uterine cavity also, owing to the removal in many places of the lining epithelium. In one specimen I found evidence of a proestrous denudation of the underlying stroma tissue. Estruation probably commences towards the close of the period of degeneration and continues throughout the recuperative stage, or perhaps even beyond it. During the latter period the uterus recovers its normal condition, though the cavity is at first larger in size than at any other time throughout the cycle.”

A similar cycle in primates is described by Heape in his experimental work on the monkey.

In the lower animals menstruation and ovulation are concomitant, but in higher forms they are separate processes. According to Fraenkel (1903) the corpus luteum is a secreting organ in the ovary which controls the nutrition of the uterus, not only during pregnancy, but throughout the whole uterine cycle. Fraenkel destroyed the corpora lutea of pregnant rabbits by using a galvano-caustic needle, and found that pregnancy did not continue unless at least one corpus luteum was allowed to remain. Glass (Halban 1901) has shown that in the case of a woman with whom menstruation had ceased in consequence of ovariectomy, it was again induced by grafting of a new ovary. Knauer (Halban, 1901) has performed similar operations on the dog and similar results were obtained. Halban finds that after removing the ovaries of monkeys menstruation ceased, while it continued after grafting of the ovary. In these experiments the ovary was grafted in a position different from the normal, which shows that the recurrence of menstruation is not purely a nervous phenomenon. These facts show that the ovaries, like the testes, are organs of internal secretion, besides being dehiscant glands for the production of the sexual elements, and that this secretion, among other things, governs the phenomenon of menstruation.

Regarding the periodicity of the menstrual cycle in woman, Heape (1901) puts forth much evidence in support of the view that she was primarily monestrous; that is, ovulation and menstruation primarily occurred but once a year. In support of this theory there is ample reason for the belief that the sexual season is governed directly by climatic, individual and maternal influences. Regarding climatic factors, Heape states that many Eskimo women do not menstruate during the long winter months. Menstrual irregularities are said to be quite common among the women of savage tribes. Animal females that are monestrous in the wild state readily become polyestrous under the influence of domestication. Menstruation and ovulation in woman is therefore not a simple primitive phenomenon, but a complex and greatly modified physiological cycle. In this sexual evolution modified by civilization, Heape points out further the possibility that the menstrual cycle may have increased more rapidly than the ovulation cycle. This conforms to the well-known fact that ovulation is not necessarily synchronous with menstruation.

There is still another line of evidence that must be appealed to in the elucidation of this problem. If the evolution theory stands for anything, there was once a time when the young of all females were born without experiencing any uterine existence. There has been a gradual evolution of the intrauterine life until now the period of gestation may be twenty-one days, as in the rat, or thirteen months, as in the zebra. This first period of gestation has certainly had a pronounced effect upon menstruation or the estrual cycle. The inference is that such a cycle must have wrought substantial changes in the uterus, particularly in the mucosa, as well as fundamental constitutional alterations.

While the phenomenon of menstruation and its significance is still unsolved, facts bearing upon the subject are rapidly accumulating. The experimental work on the estrual cycle in the animal female is yielding positive results, and it is along these lines of investigation that we must look for a final solution of the whole problem.

SUMMARY.

1. The exact structural change in the uterus of woman during menstruation has not been determined, largely through lack of material and want of experimentation.
2. Menstruation in woman is the same phenomenon as the estrous cycle or "rut" in the animal female.

3. The structural uterine changes during "rut" in the animal female resulting in a loss of uterine epithelium, is not a mechanical exfoliation due to the extravasation of blood, but involves intra-cellular pathological changes.

4. The ovary is an organ of internal secretion, which governs the menstrual cycle through the medium of the blood.

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TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

Meeting held at Hot Springs, Virginia, May 22, 23 and 24, 1906.

Concluded from page 834.

Discussion on the paper of DR. CURRIER on

DEVELOPMENT OF CANCER IN THE CERVICAL STUMP AFTER
SUPRAVAGINAL HYSTERECTOMY.

DR. HENRY P. NEWMAN, of Chicago, showed a specimen and slides of a carcinoma which developed seven years after primary operation of extirpation of the uterus for multiple fibroids. The woman was healthy up to the development of this, about ten years ago. She gave the usual history of fibroids, and seven years ago he removed large multiple fibroids by supra-pubic amputation. These tumors were about the size of a fetal head at term. She remained well until a year and a half ago, when she began to have recurrence in the cervical stump. When brought to him in January, carcinoma was discovered in the stump of the cervix. Prompt removal was advised, which

*See page 831.

was resorted to. The disease had not advanced beyond the area of the stump. It was of a very malignant type, as the pathological report showed. He said the suggestions offered by the essayist should be considered very carefully.

As to the advisability of panhysterectomy in all these cases of fibroids, he would say that the cervix was seemingly healthy in this case, as the woman had borne two children, or as healthy as one would expect to find it in a woman of that age, who developed fibroids. He hoped the subject would be thoroughly discussed, inasmuch as this case had rather changed his idea of what ought to be done, even in practically normal conditions of the cervix. It was easy to extend one's operative work from a simple suprapubic removal to a panhysterectomy, which had not been considered heretofore.

DR. CHARLES P. NOBLE, of Philadelphia, stated that had he known the paper was going to take such a wide scope, he would have brought along some statistics which would have been germane to the subject. So far as his own experience went, he had had two cases of cancer of the cervix following supravaginal amputation. Roughly speaking, in six hundred cases he had had three hundred fibroids and as many more for other conditions. One of these cases occurred a number of years ago, when it was his habit to have all cases examined microscopically. This patient had no knowledge of cancer of the cervix. This was a case of cancer of the cervix following removal of the fibroid. The cancerous condition was overlooked. In six hundred cases he had had one case of cancer of the cervix following operation. As he had been studying fibroids for years, he said the latest paper on the subject was one by Winter, who reported 16 cases of cancer of the cervix following supravaginal amputation. This included all cases in the literature. While the percentage of cases in which this condition occurred following operation was comparatively small, it was nevertheless worthy of consideration and reflection. It certainly would not influence him, however, to change his technique, unless the future showed a very much larger percentage of occurrence of cancer than was shown at the present time. The primary mortality from supravaginal amputation was lower than that following total hysterectomy.

In speaking from memory of some of the other points raised by Dr. Currier as to the question of cancer arising from fibroid tumor, some years ago he removed what he considered a degenerative fibroid tumor from an old maid of sixty, and to his surprise the pathologist reported it as an epithelioma. This pathologist was present at the time of the operation. He cut the tumor open to see whether the woman had cancer of the corpus. When the pathological report came that it was an epithelioma, he was at a loss to understand the matter, because the woman had a healthy cervix. After prolonged study by

Drs. Pierce and Cullen, it was concluded that the woman had a small adenocarcinoma that had been overlooked, and that had invaded the fibroid, and by metaplasia the cells had taken on the appearance of squamous-cell epithelioma. Piquand, whose paper was referred to by the essayist, had studied this matter carefully and had found quite a number of cases of cancer after fibroids. The probabilities were that after further study it would be found that all of the cases of cancer arising directly from fibroids were cases of adenomyomata, and not of myomata. At the present time he had collected a series of five thousand cases of fibroid tumors to study the relation of cancer to myoma, and he said that the evidence was overwhelming that the presence of fibroid tumors of the uterus led to cancer.

DR. WALTER P. MANTON, of Detroit, operated on a woman 45 years of age, about three years ago, who had an immense fibroid tumor extending above the umbilicus. She had had repeated hemorrhages and had been consulted by a number of different physicians who had tried to relieve her by operative measures. The appearance of the fibroid was that of the ordinary growth. He expected the woman to make a good recovery, which she did, from the primary operation. Three months later she telephoned him from a suburban town that she was having hemorrhage from the vagina and he advised her to come and let him see what the trouble was. At the operation he left only a very small portion of the cervix, having shelled it out, and the tissues were apparently perfectly normal. When she consulted him a second time, however, he found a large cauliflower growth projecting from the external os, very friable, which bled profusely on the slightest touch. He immediately removed the small stump, including the growth, and then had the original tumor examined. The pathologist found that the new development or tumor was a spindle-cell sarcoma. This was the only case of its kind he had been able to find in the literature.

DR. WILLIAM M. POLK, of New York, said he took it the question at issue was, Shall we or shall we not remove the cervix in cases of hysterectomy. He would say that we knew very little about it except for the light which had been thrown on the subject to-day. The point in favor of leaving the cervix had been well brought out, and while undoubtedly we had reason to believe that tissues such as the cervix were likely to undergo malignant degeneration wherever there was epithelial structure, it was not a matter of great surprise if one met with this form of disorder. The question as to whether the disease could be detected at the time of the original operation or not seemed to have been met by the report of a case in which five years elapsed between the operation and the development of the disease. He did not think we were in a position to decide the question except on general principles, based upon the observations which had

been presented by the several gentlemen who had spoken. Arguing from analogy, one would infer that a curtailment of the source of nerve and blood supply to the cervix would have a tendency to diminish rather than increase the disposition toward malignant degeneration.

DR. FERNAND HENROTIN, of Chicago, said the operation of supravaginal amputation was so ideal and had produced such beautiful results, and had been taken up by such a large number of the profession, that everything bearing on the removal of the cervix would probably be regarded in the proper light, and he offered the suggestion that all cases of this kind reported in the future should be carefully investigated, so as to make sure that the diagnosis of carcinoma is carried out both by clinical and pathological findings. There was no question but that after supravaginal amputations operators left more or less of the stump of the cervix. He thought probably it was the habit of a good many operators, like himself, to leave quite a bit of tissue above the mere cervix, to be reconstructed and covered up by peritoneum. It sometimes happened that hemorrhage occurred from the portion of cervix that was left. A great many had undoubtedly seen hemorrhage from the cervix after supravaginal amputation. He recalled two or three women who claimed that they had menstruated for months and months afterward, and there was no question where the blood supply was cut off that there was a tendency to the formation of granulation tissue and the oozing of blood from the cervix.

Three years ago he operated on a woman for a suppurative lesion; he found the whole pelvis very much involved. He removed both ovaries and tubes, and did hysterectomy. Two years later the woman returned to him blanched by a severe hemorrhage. She had granulation tissue and an excavated cervix. He was certain that this was a case of carcinoma of the cervix. He operated per vaginam and removed the cervical stump as completely as he could, and the woman had been well ever since. Much to his surprise, although it had the earmarks and physical signs of carcinoma, examination of the cervix and of the tissue around it by the pathologist proved the condition to be one simply of granulating, bleeding stump, that came from inside the cervix, and had pushed out the granulations through the cervix, and was non-malignant.

In arriving at a conclusion from the small hemorrhages from the cervix after supravaginal amputation, we should be careful to insist upon proof of the malignancy of the condition found.

DR. M. DÜHRSEN, of Berlin, Germany, by invitation, said that cancer of the cervix could arise from the portion of cervix left after supravaginal hysterectomy. The fact that this could occur spoke in favor, in his judgment, of vaginal hysterectomy in cases of fibroids of the uterus, because in the extirpation of fibroids vaginally the cervix was removed without any difficulty.

In all the cases he had seen operated on in America for fibroids

he believed it would have been possible and much easier to have taken away the myomatous uterus through the vagina. It was possible to take out a large myomatous uterus through the vagina with the aid of the vaginoperineal incision, incision of the levator ani muscle. In one case which he operated on at the Polyclinic in New York the myomatous uterus was as large as a man's head, the patient being an old woman with a narrow vagina. He split the vagina with this incision and removed a large myomatous uterus without difficulty.

DR. CURRIER, in closing the discussion, said he hoped no gentleman supposed that the object of writing his paper was in the least revolutionary, because he felt perfectly satisfied that the operation of supravaginal hysterectomy was probably a permanent one; it was a good operation and he saw no reason why it should not continue. He was impressed with the narration of the case by Dr. Noble of the development of cancer in a virgin of 60 within the body as being quite suggestive. He had a similar case to that only a few months ago in a woman of 61, a virgin, and the supposition was that it was simply a case of fibroids or myomata, but it proved to be very extensive cancerous development. The growth was removed.

THE SEARCH AFTER TRUTH.

This was the title of the President's address, which was delivered by DR. RICHARD B. MAURY, of Memphis.

Dr. Maury referred feelingly to the deaths of Dr. A. Palmer Dudley, New York; Dr. James R. Chadwick, Boston; Dr. Arthur W. Johnston, Cincinnati, and Dr. R. Stansbury Sutton, Pittsburg, which had occurred during the year.

He then made some remarks on the subject of uterine displacements and referred to a discussion on antelexion which was had before the Society in 1888. This discussion was participated in by T. Gaillard Thomas, Graily Hewitt, Sir Wm. Priestley, and others, the conclusion having been reached by those eminent men at that time that the man who would not use pessaries in the treatment of antelexion was unfit to practise gynecology. The intrauterine stem, the speaker said, had passed out of the history of gynecology, perhaps forever, and would never again come into favor. The knowledge of pelvic inflammation was so fully disseminated now that every practitioner realized the peril to a woman from its use.

When one considered the various operative procedures which had been devised for the cure of backward displacements, and noted that nearly all of them involved the shortening of one set of ligaments or another, or else the suspension of the uterus from above, he must conclude that the present practice was generally accepted by the profession. Attention was then directed, at considerable length, to how the uterus was sus-

tained almost entirely by its ligaments, as it was thought by some, but he said that some of the teachings regarding this matter were erroneous in that the proper supports of the uterus were not the ligaments, but the various structures which constituted the two segments of the pelvic floor, as was demonstrated by Hart and Barbour. The President then discussed the various methods of repair of injuries to the pelvic floor. In conclusion, he thanked the members for the distinguished honor conferred upon him in electing him President.

RESULTS OF VAGINAL SECTION AND DRAINAGE IN EARLY
CASES OF ECTOPIC GESTATION.

DR. WILLIS E. FORD, of Utica, New York, said that the interest in the subject of extrauterine pregnancy had diminished very markedly since the profession had agreed upon its proper management, and since the technique of the operation had been perfected. His interest had been revived by the fact that during the month of April of this year two rather serious cases had come to him and he had taken the trouble to look up the question of early diagnosis of this condition, and the treatment by vaginal incision and drainage of his own cases. He gave the results of treatment of the few cases of unruptured tubes that he had operated upon, and he had been able to ascertain the results after a year or more. The case that interested him most and had caused him to present his clinical observations was briefly reported.

In 1897 a woman, 36 years of age, an American, twice married, came to the hospital with a moderate-sized pelvic tumor that fluctuated and seemed to be either a very large salpingitis or a pelvic abscess, the result of a salpingitis. She had a history of three miscarriages and one labor at term; but the child died in two hours. Three months previous to her admission to the hospital she had missed her regular menstruation, and had experienced sharp pains for the first month or six weeks, and then had fainting spells. But during this time she had practically no medical care. She had a slight uterine hemorrhage and a few shreds, with the general history of extrauterine pregnancy up to the time of the tenth week, when she had sharp pain, chills and fainting. It was two weeks after this (which was the probable time of rupture of the tube) that he opened the vagina through Douglas' cul-de-sac and passed his finger into the opening. A terrific hemorrhage followed, but fortunately the opening he made in the sac was so small that he was able to partially control the bleeding with the finger in the sac and then to pass iodoform gauze, having his finger in the sac until he had stopped it. There was subsequently a watery drainage; the tampon was left for six days and then, appreciating the danger of an abdominal section in case he got a bad hemorrhage, he re-

moved the gauze. In doing this he had another sharp hemorrhage, of such magnitude that the woman instantly collapsed, and she was tamponed again with gauze, because it could be done more quickly than the abdomen could be opened, and she revived and went on to a recovery.

He had never seen any hemorrhage so severe, and made up his mind that he would not do any more vaginal sections in ectopic gestation. The case made such a good recovery afterwards, and the mass so thoroughly disappeared and everything seemed so normal, without adhesions, that he subsequently tried it in twelve cases, which he reported.

In April, of this year, the same patient returned to the hospital, with a history of miscarriage, that had been cared for, which was followed by a uterine hemorrhage, lasting for six weeks. She had miscarried at the third month. The uterus was opened and soon after birth was curetted, always without ether. In doing this he discovered a pelvic tumor, egg-shaped, attached to the posterior vaginal wall, and holding a quart of fluid, which he opened and drained. The sac of this tumor was attached by scar tissue to the vagina at the site of the former incision. The fluid it contained was straw-colored. On the collapse of the tube he continued drainage for a few days, and the woman went home well. She refused to have an abdominal section for the removal of the sac. It seemed to him that this last tumor was the result of the unremoved sac of the former ectopic gestation, and that if he had done an abdominal section at that time she would have been saved any further trouble. It was this circumstance that prompted him to look up the records of the twelve cases of extrauterine pregnancy that he had operated on by vaginal section, with the view of ascertaining what condition followed in the other cases, and therefore whether even a successful vaginal incision was justifiable in this trouble. In 1897 he was very much interested in the question of vaginal section and operated on five cases in that manner.

The fact that the cases operated on early left almost no trace of anything wrong in the pelvis afterwards, and that the operation was so safe and so certain in its results, had impressed him that the Society should urge early diagnosis and early operation of all cases of extrauterine pregnancy.

If the teaching in the medical schools could be so modified as to impress upon medical students a more careful consideration of the subjective symptoms until skill enough had been acquired to enable the verification of the diagnosis to be made with certainty, he was sure that these cases of ectopic gestation would be seen early enough to be operated upon, and thus prevent rupture and hemorrhage in a large number of instances.

DR. FERNAND HENROTIN, of Chicago, said that vaginal section in cases of ectopic gestation that were properly selected was a procedure of the greatest value. He called attention to the

great danger from excessive hemorrhage, and said that we were not in a position to control it in the acute active cases. He thought the essayist spoke in a rather indefinite way in reference to unruptured cases, in that he had not furnished unmistakable evidence that the cases were unruptured, and the good results he obtained in the majority of them were due to the fact that the ovum was already dead, and that he had operated on hematocele in the broad ligament. So far as he could learn, from what the essayist had said, he had operated upon a hematocele in the broad ligament from a ruptured pregnancy, although the hemorrhage may not have been great in the broad ligament. This was one of the most satisfactory operations; that is, to make an incision behind the cervix, split the broad ligament fold, clean out the hematocele, provided the ovum was already dead. When we had a blighted ovum which could be cleaned out, it was a trivial operation, with absolutely no symptoms following it; it was ideal. In his opinion it was not proper to operate upon an unruptured case by vaginal incision if one wanted to get a good result and the ovum was alive. When once the ovum was dead and the vessels blocked up, one could operate with safety. The operation was then ideal. He had removed babies of very small size up to eight and nine months, when dead, through the vagina.

DR. T. J. WATKINS, of Chicago, thought the members were of one mind in regard to the treatment of neglected cases of hematocele that became infected. These were ideal cases for incision and drainage. It was absolutely impossible to distinguish between some cases of tubal pregnancy and pelvic infection. We frequently saw cases in which the conditions were associated, and in which it was very difficult after consulting the hospital records, eliciting a careful history, the findings, etc., to distinguish between the two without abdominal section. In all cases of tubal pregnancy save those of neglected infection and hematocele, abdominal section with extirpation of the tube itself was the ideal operation.

DR. I. S. STONE, of Washington, said the use of a large amount of gauze in any case was a confession of failure of surgery. He did not believe any surgeon had the right to use gauze as a packing to check hemorrhage when he could use a ligature or suture, or even the cautery. When one could reach any bleeding point, either anterior or posterior to the fundus of the uterus, it seemed to him that he ought to do it, and not allow the patient to return to her bed bleeding from the gauze used in packing.

In regard to the pathology of extrauterine fetation, in a number of instances it was known that the broad ligament did not contain the fetus and membranes. It did not always contain a hematoma. There were a number of cases of tubal abortion and hematoma forming after the rupture of the tube, behind the tube, in the pelvis. One did not know whether he had

to deal with a rupture in the broad ligament or not before operation, and very often even with the cul-de-sac open. Therefore, if one attempted to pack a large amount of gauze into a sac merely containing an adventitious covering instead of the broad ligament, it was an unwise thing to do.

DR. MATTHEW D. MANN, of Buffalo, N. Y., did not believe in operating upon these cases, as a rule, through the vagina, where the fetus was alive, and yet there might be an exception to that occasionally. His first experience in this line was disastrous. He reported a case to the Society a number of years ago, where he operated through the vagina, following a paper read by one of the members, which gave him the idea it was a good thing to do. Patient had a profuse hemorrhage. He packed the vagina, and left the patient in good condition. After he left the hospital she had another hemorrhage; the house surgeon packed at once, but the woman died. If he had been called immediately in this case he thought he would have opened the abdomen, and by this means might have saved her life. He had since then been opposed to operating vaginally in cases of infected hematocele.

DR. SETH C. GORDON, of Portland, Maine, said he believed the first rule of surgery was to save life. He heard Lawson Tait make the statement at a meeting of the British Medical Association that no man ever made a diagnosis of extrauterine pregnancy before rupture. In a great many cases the diagnosis had been made before rupture. He believed that he performed the second successful operation for extrauterine pregnancy in this country. This case was diagnosed by a former student of his twenty-four hours before he operated. He did not think when a man made a diagnosis of extrauterine pregnancy he should attempt its removal through the vagina. He did not believe it was possible for anyone to do as good work through the vagina in these cases as it was by opening the abdomen. In the first place, one had an exceedingly sensitive tube to deal with; it was almost ready to rupture, and one could not do this work as well through the vagina as through the abdomen. The Society should not go on record that vaginal work was to be done regardless of what the conditions might be. It was not safe surgery, which was the only groundwork for good surgery.

DR. J. RIDDLE GOFFE, of New York City, thought the condemnation of vaginal work was due entirely to the fact that when men spoke of operating through the vagina they meant simply an opening in Douglas' pouch. This was condemning the vaginal route from an altogether too narrow limit. In his judgment, there was no method of approach so direct, so complete, so simple, as the vaginal route in cases of ectopic gestation. When he spoke of the vaginal route, he meant an opening through the anterior vaginal fornix. If one made an opening simply in Douglas' pouch, he must depend upon the consistency of the tube to drag it down, to get it where he could apply a ligature,

and this was a dangerous and desperate piece of work. On the other hand, when one opened through the anterior vaginal fornix, he had everything under his eye and was following the most direct route possible to reach the conditions.

DR. CHARLES P. NOBLE, of Philadelphia, said he thought all were agreed that the way to deal with septic hematoceles was by incision through the posterior fornix. His experience had been that in one-half of the cases he had so treated, subsequently he had to do an abdominal section to remove the diseased tubes. Therefore, while this was the safest way to deal with tubes, it did not cure the patients in more than fifty per cent. of the cases. Recently he had an experience in operating through the vagina which, if his convictions were not already formed, would have influenced him. He supposed he had an inflammatory case to deal with. He opened into the posterior fornix and before he could get the abdomen open and the bleeding stopped the hemorrhage was so excessive that the woman died.

With regard to how to deal with the ruptured cases, he had operated on about a hundred such cases altogether, and his experience with this type operated on by abdominal section had been that there was one death in somewhere between eighty and ninety cases. This woman had consumption and Bright's disease. She died of acute uremia.

DR. HENRY P. NEWMAN, of Chicago, said, in regard to the operation for ruptured tubal pregnancy, there should be a distinction made between hematoma and hematocele. Bleeding into the free peritoneal cavity was one thing, and hemorrhage from the broad ligament or from hematoma was another. He agreed with those who condemned the operation through the vagina where the fetus was alive. He would make that one of the exceptions to the vaginal operation, where the hemorrhage was into the broad ligament, the hematoma not occurring frequently; but occasionally a case could be attacked with safety through the vagina.

DR. PHILANDER A. HARRIS, of Paterson, New Jersey, said we should not attempt to pass quick judgment on anything unless we understood it, and, in closing the discussion, he hoped Dr. Ford would state whether these cases were operated on by an anterior or posterior incision; also in what proportion of cases or in how many of them hemostasis was effected in a satisfactory surgical manner, and if he relied for hemostasis upon the packing in this rather loose-walled hematocele sac.

DR. FORD, in closing, said that he had related one case of infected hematocele as showing what was possible to do after hemorrhage had taken place. He had no idea that the members would interpret his paper as saying that he was operating through the vagina in all of these cases. He thought it was a safe thing to do in a case of infected hematocele. He got his first hemorrhage from a ruptured case in 1897, when he was beginning to do vaginal work.

As to the twelve cases mentioned in the paper, he did not know that in every case they were instances of ectopic pregnancy. He thought it was a good thing not to take his finger out of the opening in the sac until he knew whether there was any blood there or not. In fact, he never took his finger out of the smallest opening in the sac until he knew whether or not there was blood in it. He did not turn the clots out in order to clean out the tube, nor in any way evacuate it. He left his finger in the opening in the sac until he applied a piece of gauze firmly against it to control hemorrhage. He thought it was a good deal more risky to attack these hemorrhagic cases through the vagina than through the abdomen. It was his rule to operate on them through the abdomen. If the general practitioner would bring cases of small swelling, with an occasional history of ectopic gestation to the operator before he (the general practitioner) was able to make an accurate physical diagnosis, vaginal incision, before rupture had taken place, would, in a few cases, give very good results.

SYMPOSIUM: IMMEDIATE AND REMOTE RESULTS OF SO-CALLED CONSERVATIVE OPERATIONS ON THE UTERINE APPENDAGES: OVARIES AND TUBES.

DR. SETH C. GORDON, of Portland, Maine, read the first paper, entitled,

(a) A REVIEW OF SURGERY OF THE FEMALE PELVIC ORGANS.

The author presented the following conclusions:

(1) That the Battey operation was one that did an immense amount of good in the practice of men of experience and skill in operating. The results in many cases were often delayed for obvious reasons. That undoubtedly much more harm than good was done because of inexperience in pathology and operative skill.

(2) That the so-called conservative gynecology in too many instances was but a conservatism of diseased organs, in whole or in part, and not conservative of the health of the patient.

(3) That the sentiment was already changing from this extreme conservatism to more careful consideration of the future condition of the patient, as instanced in a more general belief in hysterectomy for fibroids of the uterus instead of myomectomy.

(4) That in resections of the adnexa regard should be paid to the history of the cause of infection rather than to the macroscopic condition, as the virulent germs produced changes that required total removal, together with the uterus, as the only safety to the patient.

(5) That in malignant disease of the uterus efforts should

be made to discover it early, when panhysterectomy might be done to advantage. Advanced cancer might be treated tentatively by curettage and actual cautery. The extremely extensive operations of attempting removal of a wide margin around the uterus had proved unsatisfactory, with a very high mortality and early recurrence.

(6) That surgical measures for displacements were still *sub judice*, so far as any agreement as to any special method is concerned.

(b) CONSERVATIVE OPERATIONS ON THE OVARIES.

DR. J. MONTGOMERY BALDY, of Philadelphia, said that senile sentiment had no place in deciding what should be done in the presence of a diseased ovary. Nor was the anatomical limit of disease and health in this organ the only thing to be considered. It was difficult to tell what was and what was not disease in the ovary, even microscopically, and in a very large number of instances it was necessary to decide the question by the symptoms and not by the make-up of the organ. Conservative operations on the ovaries were so commonly mixed up with the removal of adhesions, replacement of the uterus and other accompanying procedures that it was utterly impossible to distinguish between results. Immediate results and end results were different. End results were not always reliable. It was only by the survey of the whole case, general as well as local, together with a profound practical knowledge of human nature, as well as a sublime respect for the vagaries of woman's nerves that one could appreciate the full truth.

He cited an instance illustrating the moral effect of a surgical operation.

Again, end results were important in that large numbers of women were operated upon, the lesions corrected, and yet no good or only temporary results were obtained. Cases were cited in point.

Putting the fact squarely before the ordinary woman, giving her full, unprejudiced freedom of decision, he believed that in twenty-four cases out of twenty-five she would decide for a complete operation. Sentiment existed largely in the doctor, not in the woman, and the few who were influenced by it had been educated up to that point by the class of doctor who objected to the removal of ovaries, because he found on analysis of a group of cases, that "78 per cent. subsequently suffered a notable loss of memory; 60 per cent. were troubled with flashes of heat and vertigo; 50 per cent. became irritable, less patient and so re so changed as to give way to violent and irresponsible fits of temper; 42 per cent. suffered more or less from mental depression; 35 per cent. increased in weight and so re became abnormally fat," his general intelligence being such as not to appreciate that the picture he drew as one of bad

results following faulty judgment was merely the symptoms of the natural and inevitable menopause, and which would, in a short time, leave the woman as surely as they came to her.

(C) FACTS AND FIGURES OF END RESULTS IN ONE HUNDRED CASES OF CONSERVATIVE OPERATIONS ON THE UTERINE APPENDAGES.

DR. WALTER P. MANTON, of Detroit, Michigan, stated that in order to ascertain his own experience along conservative lines he had taken 100 cases from his notebooks. Of the 100 women, there were 30 single, 64 married, and 6 not noted.

The following operations were done: Both ovaries were resected in 17 cases; right ovary in 26 cases; left ovary in 13 cases. Puncture of both ovaries was done in 22 cases, right ovary in 8 cases, left ovary in 14 cases. In 19 women the ovary of one side was found to be so largely involved as to require removal; the right in 6 instances, the left in 13. Resection was done in both tubes in 13 cases, the right tube in 4 cases, and the left tube in 9 cases. It was found necessary to remove one tube in 10 of the patients, the right in 4, and the left in 6 cases. The opposite side was left untouched or resected.

In the 100 women the immediate results were entirely satisfactory; that is, all the patients recovered from operation and were relieved from the sufferings of which they formerly complained. The mortality was, therefore, *nil*, and the results temporarily perfect. The majority of these cases remained under observation for at least three months. Following this quarter year, 61 were known to be well at the present time; 31 had been lost sight of; 5 were doubtful, complaining of pelvic pain referable to the resected ovary, but in which no change could be detected on examination; and 3 had required a second operation for the removal of the conserved organ, which had undergone in each instance further cystic degeneration.

Of the 64 married women, 55, or 85 per cent., and of the 30 single women, 23, or 75 per cent., were well a year following operation. Of the 64 cases of whom knowledge was had a year or more following operation, 41 were married. Of this number, 6, or 14 per cent., subsequently became pregnant; 4 of these were delivered at term; 1 aborted at the third month, and 1 was still pregnant.

From the foregoing he maintained that his own statistics and those of others showed that the conservative surgery of the ovaries and tubes, having passed the experimental stage, had established itself as a legitimate and successful operation in all the conditions to which it might be properly applied, and that it should be the operation of choice in all instances during the child-bearing age, where the diseased state of the organs admitted of its employment.

PROFESSOR DÜHRSEN, in opening the discussion, said that if permanent success after conservative operations on the adnexa was to be attained, care should be taken to remove all pathological conditions of the genital organs, and especially those of the uterus. Inflammatory conditions or displacements of the uterus, lacerations of the cervix, etc., had an irritative action on the adnexa, as well as the scars that were left behind, and made the success of the operation an illusion.

This postulate was often neglected by German surgeons, who practiced chiefly ventral operations. Vaginal celiotomy, which was the proper operation in 80 per cent. of these cases, worked against this neglect, since the required interference with the uterus was more easily carried out by the vaginal than by the ventral route.

Following this postulate, the speaker said he did not hesitate to antefix even an anteflexed uterus, and excise diseased tubes from the horns of the uterus by both vaginal and ventral celiotomy, as he had done in some cases in New York recently. Some months after operation a cauterizing treatment of the cavity of the uterus had to be carried out, since occasionally the curetting and cauterizing might not be sufficient to thoroughly allay the chronic endometritis. At the end of this after-treatment, the discharge, as well as the pains in the sides, entirely disappeared.

In order to relieve pain immediately, the thorough extirpation of diseased tubes was, above all things, necessary. A diseased tube should be left behind only when, after the removal of all adhesions, its ostium appeared open, and when a great desire for conception had been expressed. Under these circumstances, however, it might be found that either no conception or a tubal pregnancy occurred, or that the continuance of the disorders compelled one to make a supplemental operation for the removal of the second tube. He had never seen subsequent pregnancies after salpingostomy.

A chronically inflamed ovary might sometimes be left behind, if the tubes had been removed, without the fear that it would cause any substantial disorder. It was always well, however, to resect any visible follicles, or to destroy them by ignipuncture. The author had seen pregnancy take place after the extirpation of the adnexa on one side, and the above-mentioned treatment of the ovary on the other. Anyhow, by means of this conservative mode of procedure the woman retained her menstruation and sexual character, which for psychological reasons was of great importance to her. Attention should be paid to the fact that pain coming from other organs, such as an inflamed appendix, or an adhesion of the omentum to the abdominal scar, was often interpreted as arising from the adnexa after a conservative operation. This pain required the removal of an inflamed appendix in the first operation; or vaginal instead of

ventral celiotomy. After vaginal celiotomy adhesions between the peritoneal wound and the omentum were not possible. By observing these precautions, and by always using catgut, the results of conservative operations on the appendages in which the uterus and at least the remains of one ovary were left behind, were extremely favorable. The author could say, after a careful observation of over a thousand such operations, that any supplemental operation was necessary in only two per cent. of the cases.

In women, therefore, under 40 to 45 years of age extirpation of both appendages and the uterus was indicated only when both ovaries presented collections of pus, or when both ovaries had undergone total cystic degeneration.

In young women under 40 or 45 years of age, if one was compelled to remove an inflamed or myomatous uterus, it was well to remove both tubes, but to leave at least one ovary behind, if it was normal to some extent.

DR. FERNAND HENROTIN, of Chicago, said that so far as he could judge, at least 30 per cent. of the patients upon whom he had operated conservatively on the tubes and ovaries, not including the septic and inflammatory cases of unusual type, remained partially uncured, or a good many of them were fully as bad as before. The one particular thing he would draw attention to, because we were here to give individual views, was the matter of conservative operations upon the pelvic organs of women through the vagina. With all due regard to and proper courtesy for Professor Dührssen, who came to us with a wide experience, he wished to emphasize the propriety of selecting cases for conservative work through the vagina very carefully. There was no one set of cases that needed more particularizing, more specialatching and careful selection than those of young women, because they were the ones whose tubes and ovaries were to be conserved. They were bad subjects for vaginal work unless the impression prevailed that the vaginal route should be made the usual one. There was a great deal of doubt about the method of attack in these cases, and in his judgment the vaginal route was to be used only occasionally and in very carefully selected cases. Any operation that involved cutting the introitus vaginæ, the splitting up of the perineum, was not proper conservative work on young women. If one had to split down the vulva to give room, and work on the adnexa, he thought he could do infinitely better work through the abdomen.

DR. J. RIDDLE GOFFE, of New York City, said the paper of Dr. Manton was extremely convincing. Those who insisted upon doing a radical operation in all cases claimed that their patients were all cured; they said they had 100 per cent. of cures, whereas, according to the account given by Dr. Manton, they had only 60 per cent. This was a false position to take.

It was known that not 100 per cent. of patients were cured by any operation, and those who did radical work would all admit that they had a great many failures. There were many cases in which they did not effect a cure. When a patient consulted a physician for the purpose of undergoing an operation, if he stated that he was going to cure her by removing her appendages, he was working on a false basis, because a large percentage of cases were not cured by radical operation. Those who were doing conservative work knew that a certain number of cases were not cured by conservative operation. The question was whether the number of cases cured by conservative measures was greater than the number cured by radical measures? This was a fair proposition. We could come to a conclusion only by making a study of a certain definite number of cases, finding out from those men who do radical work how many cases they have failed to cure, and from those who do conservative work how many they have cured and how many they have failed to cure. When the results of the two were compared, we would have a basis for consideration.

He did not believe it had been absolutely proved, as yet, that the ovary emitted a certain secretion which was absolutely necessary to a woman's health. However, he thought data were rapidly accumulating which pointed strongly in that direction, and this was one of the hypothetical reasons, perhaps, why he believed in conservative work and in saving a fraction of an ovary in cases where this could be done, being reasonably sure that the fraction that was left was healthy.

DR. PHILANDER A. HARRIS, of Paterson, N. J., said that 95 per cent. of all women upon whom he had operated for the removal of pus tubes in the past six years continued to menstruate afterwards; that not all of these women were relieved of pelvic pains. It was a singular fact, however, that the women who gave a history of continuous dysmenorrhea, and who had added to that increased pain before, during, or after menstruation, were, by the removal of their pus tubes and leaving in the ovaries, relieved of the pains which were produced by the diseased tubes; but they were not cured of the dysmenorrhea which characterized their lives before they had acquired the pus tubes, so that in taking these histories he had been careful to find out whether patients suffered from dysmenorrhea before there was a history of salpingitis. He could confidently tell such patients that the removal of the pus tubes would not cure the dysmenorrhea which they had, but that it would relieve all the pains which they had when the disease began. He had left in some tubes, desiring to be more conservative and to give patients an opportunity to become pregnant; but he had to operate on those patients again on account of infection of the tube. He had not accomplished much by conservatism as applied to diseased tubes. He could not always

tell when the ovaries were diseased, so that he did not leave them. If both ovaries contained abscesses, and he desired to obtain for the woman menstruation, he would split a piece of the ovary in two, cauterize it with carbolic acid, then neutralize it with alcohol and leave it, and this would maintain menstruation.

DR. REUBEN PETERSON, of Ann Arbor, Michigan, said he thought the members were all agreed that in the removal of fibroid tumors it was well to leave in one or two ovaries. He had given both methods a fair trial. He had taken out more ovaries than he had left in after the removal of fibroids, but from a careful study of his cases he could not see that the women were any better off, either symptomatically or in any other way where he left in one of the ovaries or both ovaries after hysterectomy for fibroids, and after taking them out he had tried to follow the cases carefully.

He expressed his admiration of Dr. Manton for the manner in which he had worked up the subject. He asked Dr. Manton whether he examined the women themselves, or received reports from their physicians, or from the women themselves? If he obtained the reports from the women themselves, they were far different from those he had received.

In regard to ovaries that were punctured, some four or five years ago he began to have microscopical examinations carefully made of parts of ovaries or of certain ovaries he thought were diseased, or that needed puncture, and the pathologist reported that he was puncturing normal ovaries, so that he made up his mind that if he took statistics for conservative operations upon the ovaries it would be a good idea. Once in a while, as he followed the work, he would get an ovary that was two or three times the size of a normal ovary, and he would say that here was something that was pathological. He would cut into the cyst, scrape it out carefully, sew it up with catgut, send the specimen to the laboratory for examination, and again his hopes would be doomed. Reports would come back that he had taken out a normal or enlarged corpus luteum. So it seemed to the speaker that the whole question was in a confused state. With increased experience and observation he was prompted to do less and less conservative work on these organs.

DR. I. S. STONE, of Washington, D. C., said he had striven to do conservative work on the organs of women who were desirous of bearing children, in some instances leaving one tube and one ovary; in pus cases, if necessary, washing out the tube and leaving it. He had reported his conservative work on these organs in a recent article, published in the *AMERICAN JOURNAL OF OBSTETRICS AND DISEASES OF WOMEN AND CHILDREN*.

Many women were sent to gynecologists with dysmenorrhea who had cystic ovaries. He had no reason to believe that he had cured any such case by removing a small cyst of the ovary

either by ignipuncture or by excision and closing over the remaining portion of the ovary.

A legitimate field for conservative work was in the relief of sterility.

DR. WILLIAM H. BAKER, of Boston, Mass., said he believed in doing conservative work on ovaries whenever possible. He reported a case that occurred in his practice some years ago. The woman had suffered for a long time. Her physician said she must have her ovaries removed. On examination and at the operation he found the condition to be one of ovarian cystoma, on one side a diseased tube, and removed it. On the other side there was a tumor of the ovary about the size of a hen's egg. He removed it and left a portion of the ovary, contrary to the wish of the physician who was present, and who begged him not to leave it. He left about two-thirds of one ovary. Both the husband, the wife and the physician in charge were very much disappointed. He felt, however, that he had done his duty. Within a year from that time the husband of the patient came to him saying that his wife was so well that he wanted to know whether it would be safe for her to have another child. He replied that he did not see any reason why she should not have more children. A year and a half later he received a letter from the husband saying that they were the happiest couple on earth; that his wife had given birth to twin boys, ten pounds each.

DR. HENRY P. NEWMAN, of Chicago, said personal equation entered into the discussion of this subject. One could not arbitrarily say that in case one tube was involved which demanded removal, the other tube, if healthy, must be removed. One must consider the social position of the patient, the skill of the operator, his own convictions, and the relative effects of operative work. In years gone by it was a rule to remove both tubes, even though one of them might be unaffected. He recalled the case of a prostitute, who was a confirmed morphine habitué, with involvement of one tube, the other being apparently healthy. He curetted very carefully, sterilized the endometrium as far as possible, and made a V-shaped incision in the interstitial portion of the right cornu, and inside of two years this woman married and gave birth to a child. She was also cured of the morphine habit.

DR. MANTON, in closing the discussion, said the question under discussion was to be settled by one's individual satisfaction and by one's own experience. He could not agree with those gentlemen who claimed that cystic conditions of the ovary caused no suffering. His experience had been that in a large number of cases they produced a good deal of suffering, and by relieving the tension of the cyst and destroying the cyst wall the patient was relieved. He had seen this time and again, and was satisfied it was the proper thing to do.

In reply to the questions of Dr. Peterson, he said he had had a large number of patients under his personal observation for several years, some of them for many years, and those he did not examine personally he corresponded with, or had received reports from their physicians; therefore, the percentage of recoveries as given in his paper was reliable.

THE TECHNIQUE OF THE REPAIR OF LARGE VESICAL FISTULÆ.

DR. WILLIAM S. STONE, of New York, said it was not his purpose to offer a new method of operating or to bring out any original points of technique, but rather to give the features present in two cases that had come under his observation and treatment in illustrating such technical principles as seemed especially adapted to the repair of large fistulæ.

The first case that the writer reported was a primipara, 24 years of age, who had been treated six weeks prior to the operation by podalic version, decapitation and perforation of the after-coming head. The pelvic measurements showed a slight degree of general contraction. A complete laceration of the perineum was so surrounded by cicatrices that the vaginal entrance was markedly contracted, making it exceedingly difficult to inspect its upper part. The cicatricial tissue extended into the vagina in different directions. The urethra was laid open its entire length except for a small collar at the meatus. Continuous with this opening in the urethra was one which included practically the entire septum between the vagina and bladder. It was so large that the bladder was prolapsed through the opening, the mucosa of which was uniformly and intensely congested. Its margin was inverted and adherent to the vaginal wall, especially as the upper border made it overlap the anterior surface of the cervix. With the patient in Sims' position, incisions were first made in the posterior sulci of the lower part of the vagina in order to effectively expose the field of operation. The cervix was then grasped with the vulsellum and pulled down as far as possible. The inverted and adherent bladder mucosa was dissected away from the cervix and by making a transverse incision anterior to the cervix, as in the performance of hysterectomy, the upper part of the bladder was freed as far as the peritoneal juncture. By means of blunt dissection at the sides, the entire upper portion of the bladder was thus freed, and by gradually working downward the lower part was also separated from the edges of the fistula, care being taken not to injure the ureters, the openings of which could be readily seen. The upper and more movable part of the bladder wall was then brought down and sutured with interrupted chromic gut sutures to the lower and more fixed portion, the line of suture running mostly in a transverse direction, and effectually closing the bladder. The vaginal edges, although more movable

than before the dissection, could not be brought into apposition without tension, but by bringing down the uterus which had been made movable by the dissection, and suturing the vaginal edges to the sides and end of the cervix, the opening was closed without tension. The urethral mucosa was so thin and friable that no attempt was made to free it at the torn edge, but by an incision on either side through the vaginal wall, running parallel to and about one-half a centimeter from its edge, a flap was made which, with the aid of a more movable flap around the bladder, covered in the urethra fairly well. Interrupted sutures of black silk were used in the vaginal wall. A soft rubber catheter was kept permanently in the bladder for three days, and the bladder irrigated once a day with a boric acid solution. The entire portion over the bladder healed by primary union, but a greater part of the urethra failed to unite. There was some power of retention, however, because the vesical neck was well covered. An operation, two weeks later, in which the dissection of the vaginal wall was more extensive, effectually closed in the urethra. One month later the perineum was repaired, when the function of the bladder was normal except for a slight frequency.

DR. STONE, after narrating a second case, presented the following conclusions:

"1. The basic principle in the repair of large fistulæ is an extensive separation of the bladder wall, especially of the upper part in front of the cervix, by means of which it is readily sutured to the more fixed lower portion.

"2. The uterus, which has been made movable by the free dissection entailed in the separation of the bladder or by an additional incision posteriorly in some cases, is a most valuable supplement in filling up the opening in the vaginal wall.

"3. With these principles applied, it is a matter of little importance what kind of suture material is used, or what relation the vesical and vaginal suture lines have to each other."

THE TREATMENT OF VESICOVAGINAL FISTULÆ.

DR. I. S. STONE, of Washington, D. C., said experience had shown that wounds of the bladder made during the performance of surgical operations healed readily after careful application of sutures. This occurred after injuries at the base, as in vaginal hysterectomy, as well as in those at or near the fundus, which were comparatively frequent in operations upon the uterus for the removal of tumors. Two principal causes contributed to this result. One was the healthy condition of the bladder itself, and another was the ease with which the muscular wall of the organ could be approximated when absolutely free from the uterus or vaginal wall. It had been his experience that the very large fistulæ afforded such free drainage as to secure perfectly healthy mucous surfaces of both bladder and vagina, the only exception being in one bed-ridden patient who

had been indifferently cared for, and whose fistula was covered with incrustations. It would be found in many instances that large fistulæ had persisted because they were associated with injury of the vagina of a serious character which produced extensive cicatricial contraction. Such an injury was worse than a mere incision or laceration of the vaginal wall, and included the connective tissue also, which became a permanent retractor of the margins of the fistula, and prevented its closure until surgical relief was afforded.

He had found it unnecessary to treat these cases by the tedious method of Bozeman, and now felt confident that any fistula could be closed satisfactorily by first liberating the bladder from any adherent surface or organ which prevented its closure, and then uniting the margins of the fistula with catgut, and afterwards, at the same sitting, utilizing the vaginal wall and uterus, as might be needed to support the line of sutures in the bladder wall. This was opposed to the contention of those who favored suture of the supporting base only—the vaginal wall, for example. Finally, one might draw the vaginal walls forward after suitable dissection, or he might utilize the uterus, as suggested by Kelly, which was done by drawing forward the cervix and making it secure with sutures to the anterior margins of the fistula or by using the Freund method of turning the fundus downward and then forward into the opening. This last method seemed to him quite objectionable, as it necessitated the new opening of the cavity of the uterus to provide for the escape of the menstrual flow. He had overcome the disadvantages of this method of Kelly's and had obtained abundant mobility by drawing down the uterus, cutting away the anterior vaginal wall, and dividing the broad ligaments, so as to cause less traction upon the sutures. This had also been accomplished by separating the bladder from the uterus and broad ligaments through an abdominal incision, and by a division of the broad ligaments at their upper border where they were attached to the uterus. This method had been used for the relief of fistula of any description.

The profession owed acknowledgment to Mackenrodt of priority and for clearly establishing its usefulness in almost any fistula of whatever shape, position, or size. In the treatment of small fistulæ, the vaginal wall should be divided longitudinally, the bladder separated from the vaginal wall, then united and the vaginal wall closed, each independently. He had found its best and most useful application in the closure of large fistulæ, and where failure had resulted after previous attempts at cure. Illustrative cases were cited in which excellent results were obtained.

DR. HOWARD A. KELLY, of Baltimore, discussed the subject of abdominal extraperitoneal and abdominal transperitoneal operations. He pointed out the best way to expose a difficult

vaginal fistula, and emphasized the importance of preserving the uterus. He dealt with methods of approximation in one layer and in two.

SHORTENING THE ROUND LIGAMENTS WITHIN THE INGUINAL CANALS THROUGH A SINGLE SUPRAPUBIC TRANSVERSE OR MEDIAN LONGITUDINAL INCISION.

DR. REUBEN PETERSON, of Ann Arbor, Michigan, called attention to a method of shortening the round ligaments which he had employed during the last year in a considerable number of cases.

Alexander's operation of shortening the round ligaments within the inguinal canals for the relief of backward displacement of the uterus had always been a favorite with him. In properly selected cases there were fewer relapses than with the other operations devised for the same purpose. The principle of the operation had always appealed to him. Still, in spite of its merits, Alexander's operation had its disadvantages, which he pointed out.

In the operation the author submitted for consideration, an attempt was made (1) to develop a technique which should be applicable to all cases of uterine displacement requiring relief by an operative procedure; (2) to perform the work through one incision.

A considerable experience with the transverse incision in intrapelvic work let him to try this incision first. He was surprised to find how easily the external inguinal rings could be uncovered by the transverse incision less than three inches in length. The remainder of the technique had been developed step by step, and was as follows:

"With the patient in a moderate Trendelenburg position, the spines of the pubes are located by the thumb and forefinger of the left hand. A transverse incision is made through the suprapubic fat down to the fascia slightly above an imaginary line joining these two points. The length of this incision will vary with the case, but even in the most obese patients it need not be more than $2\frac{1}{2}$ inches. The deeper portions of the incision can be cleared of the loose tissue by a few transverse strokes of the scalpel. The upper portion of the incision is now drawn upward by retractors and the fascia exposed with scalpel or sponge for a distance of two or more inches, depending upon the amount of intrapelvic work to be done, which will naturally determine the length of the longitudinal incision through fascia and peritoneum. For the ordinary case a small incision admitting one index and middle fingers will suffice. Care must be taken after separating the muscles and before opening the cavity to seize the peritoneum as far away from the pubes as possible. In this way it is always possible to avoid opening the

bladder, even when the latter is carried abnormally upward. Through this small peritoneal incision all ordinary intrapelvic work can be accomplished. Adhesions of appendages and uterus should be released and the diseased organs resected or removed. Ordinarily the appendix can be inspected and removed, if necessary, through this same incision.

"Small retractors are next inserted into the transverse incision and the tissues pulled outward. The guide to the external ring will be the spine of the pubis, at the base of which it will always be found. A few strokes of the knife will expose the ring, the edges of which should be carefully cleared. The upper wall of the canal should now be divided upward for about an inch, a curved director being used as a guide. The contents of the canal are now fully exposed. Edges of fascia should be seized with hemostats and drawn outward and forward, and the under surface of the fascia cleared for a distance of half an inch. The inguinal branch of the ilioinguinal nerve should now be sought for carefully, isolated and preserved from injury by being passed outside the outer edge of the fascia and held in this position by the hemostat which grasps the fascia.

"The round ligament will almost invariably be found lying just at the edge of and slightly underneath the muscle. It will be easily found if the contents of the canal are not unduly disturbed and its relations thereby destroyed. With the forefinger palpate and locate the internal inguinal ring. Then seize a small amount of tissue lying to the outside of the muscle and roll the latter upward. The white fibers of the ligament at once appear. Seize the tissue well down toward the internal ring, so as to avoid breaking the ligament; then strip the latter of its peritoneal covering in the usual manner. After two or three inches of the ligament have been drawn out, steady the latter with the left hand and insert the fingers of the other hand into the abdominal cavity, in order to determine the proper position of the uterus and the degree of shortening of the ligament to be secured. Mark this by seizing the ligament with a hemostat at the point it emerges from the internal ring. The opposite ligament should be located and shortened in a similar manner. After marking the degree of shortening of the second ligament, make a final intrapelvic examination, in order to be sure that the uterus is in the median line, that the fundus is forward, and that the cervix points backward.

"The nerve should now be released and dropped to the bottom of the canal. The round ligament is secured by a mattress suture of catgut, which starts just beneath the edge of the fascia, passes through the ligament just above the hemostat, catches the fascia of the opposite side just below its edge, and then is passed backward again through the ligament below the hemostat. After catching the side of the fascia from which it started, the suture is securely tied. The loose end of the liga-

ment is not cut away, but is dropped back into the canal. The cut edges of the fascia are now united with a continuous catgut suture. The incision through the peritoneum is closed in layers. All dead spaces at the depths of the incision are avoided by passing a number of interrupted catgut sutures through both edges of the incision, including in the center of the suture a small portion of the fascia. The skin incision can be closed according to the operator's desires.

"If extensive operative work is to be done, the median longitudinal is preferable to the transverse incision, although almost everything can be done through the latter. If the median longitudinal incision be started just above the pubis, the inguinal ring can be exposed almost as readily as through the transverse incision. Again, if the operator prefers the longitudinal to the transverse incision in the simpler pelvic cases, he need only employ a very small incision as far as shortening the ligaments is concerned. An incision not more than $2\frac{1}{2}$ inches in length will suffice."

In the University of Michigan Gynecological Clinic the operation described was performed upon fifty-five patients. In forty-six cases the transverse and in nine cases the longitudinal incision was employed. The ligaments were readily found in almost all the cases. They were always present. They were once or twice very small. Once or twice they broke as they were being stripped, necessitating the passing of a forceps through the internal ring, a puncture of the parietal peritoneum, and the suture of the ligament within the abdomen near the horn of the uterus. Such an accident was liable to happen and only showed the advantages of the present over the old technique. In Alexander's operation, when such an accident occurred, an additional median incision became imperative.

The author, in closing, said that too short a time had elapsed to speak of the ultimate results of the series of operations mentioned. However as far as known, there had been no relapses.

HYPERNEPHROMA RENIS, WITH REMARKS.

DR. J. WESLEY BOVÉE, of Washington, D. C., read a paper on this subject. He said that a tumor springing from adrenal tissue, whether in the suprarenal gland or displaced, was called a hypernephroma. He discussed the general characteristics of this class of tumors, saying that the tumor was usually noticed clinically in advanced life, when it assumed a considerable size, and had caused trouble that demanded relief. This fact led to the belief that these tumors were always malignant. Studied from the standpoint of anatomy and pathology, they were found in a benign state, especially in early life, and even after the age of fifty years had passed. They were found accidentally on the necropsy table, in routine work, and in such cases the tumors

were usually benign in character. The varying structural appearances noted in these tumors had led to attempts to classify them. While not fully satisfactory, a classification into alveolar and cortical was probably the best. The author then discussed the gross anatomy and pathology of these tumors, mode of extension, secondary manifestations, symptomatology, diagnosis, and prognosis.

In referring to the treatment, he said that realizing that hypernephroma was by far the most common form of renal tumor, that symptoms were so unreliable for differentiation between the benign and the early stages of malignancy, and that the advanced malignant tumor was so fatal, one could scarcely avoid recommending extirpation of every renal tumor, especially if of long duration. It went without saying that the malignant form, if seen early, more peremptorily demanded extirpation. As the *bête noir* of malignant tumors everywhere was too late operation, to be consistent with the usual treatment of malignant growths one should hail with gladness an opportunity to remove a tumor in a benign stage, rather than to accept additional dangers, both as to complications of operation and of ultimate eradication, that necessarily attended operation for malignant growths.

He protested against the transperitoneal route in extirpation. The danger of infection of the peritoneum, either by pieces of the tumor or pyogenic organisms that might be present, was certainly apparent. This necessitated the employment of the extraperitoneal route. The most rapid and useful incision was the transverse one, in that it was quickly made and furnished a wound that was easily drained without interference with prompt union of the upper or anterior portion of it. The least possible amount of manipulation of the tumor in its removal was recommended, and with reason, lest fragments of it be forced into the renal vein. The author also cautioned against rupture or puncture of the growth, as one was tempted to do, on account of its softness and extreme size.

Dr. Bovée then reported two cases. The first one was a nephroma followed by incomplete nephroureterectomy for perinephroma, adrenal tumor and pyoureter; extraperitoneal operation; recovery. The second case was one of renal hypernephroma, with acute symptoms; nephrectomy; recovery. The specimens in both cases were clinically examined at the Army Medical Museum by Dr. James Carroll, whose full report was appended to the paper.

DR. GEORGE H. NOBLE, of Atlanta, Georgia, contributed a paper on

INTRAMURAL ABSCESS IN THE PUERPERAL UTERUS.

DR. GEORGE M. EDEBOHLS, of New York City, reported a third case of

RENAL DECAPSULATION FOR PUERPERAL ECLAMPSIA.

The following officers were elected for the ensuing year: President, DR. CLEMENT CLEVELAND, New York City; First Vice-President, DR. J. CLIFTON EDGAR, New York City; Second Vice-President, DR. WILLIS E. FORD, Utica, N. Y.; Secretary, DR. J. RIDDLE GOFFE, New York, reelected; Treasurer, DR. J. M. BALDY, Philadelphia, reelected; Member of the Council, DR. RICHARD D. MAURY, Memphis.

Washington, D. C., was selected as the place for holding the next meeting, in 1907, in conjunction with the American Congress of Physicians and Surgeons.

TRANSACTIONS OF THE WOMAN'S HOSPITAL SOCIETY.

Meeting of February 27, 1906.

REPORT OF CASES.

DR. ASPELL reported

A CASE OF TUBOABDOMINAL PREGNANCY AT TERM.*

DR. WEST.—I would like to ask how much gauze was used in packing and how long it took to remove it.

DR. ASPELL.—When the child and placenta were removed and the sac was stitched to the abdominal wall, there was not a large cavity; a half-yard of full-width gauze filled it. The first dressing was at the end of forty-eight hours, and daily after that. No irrigation was used.

DR. EMMET.—Was it by the abdominal opening that the gauze dressing was inserted? Would not the lower route have been preferable in view of the presence of gangrenous tissue?

DR. ASPELL.—It was quite a large incision, and I felt I could reach the bottom of it much more easily than if I made a combined operation. I felt that the operation, as far as I had gone, was clean. I did not wish to risk infection by going through the vagina.

DR. GRAD.—I would like to ask how thick the sac was, and whether it would not have been possible to remove it at the time of operation.

DR. ASPELL.—The sac was very thin in part, composed only of peritoneum and adhesions. It was so adherent that I could

* See original article, page 39.

not have separated it from the intestines without tearing the muscular coat. It formed part of the sac wall. The interesting thing was that the placenta seemed to be attached to the new adhesions. It was an extra large placenta. I did not attempt to remove it all for fear of tearing the intestines.

DR. BACHE EMMET reported a case of

DISPLACEMENT OF THE BLADDER.

During a laparotomy for the removal of a large fibroid of the fundus of the uterus, the size of a cocoanut, which Dr. West had put under my care two weeks ago, there was found one equally large developed from the cervix and extending into the left broad ligament, thus forming with the upright mass an "L." It pressed so firmly against the pubes that it had compressed the urethra and the bladder, which, finding no space in which to expand, had taken the easiest route of dissecting up the peritoneum, reaching up behind the recti muscles with a capacity of seventy-two ounces. There, after incising the skin, fascia and muscle, I found it extending more than half way up to the umbilicus. After passing through the several layers described and failing to enter the abdominal cavity, I met with a great thickness of edematous tissue which I mistook for a much-thickened peritoneum. This I cut through progressively and tore open with my fingers until, by a spurt of urine, I became aware of having entered the bladder. This I immediately repaired by a continuous catgut stitch in the mucous membrane and a similar one in the greatly thickened muscular coat. I was obliged to cut considerably higher towards the umbilicus to enter the peritoneal cavity. After raising the uterus and shelling the projecting tumor out of the broad ligament, the bladder dropped down out of the anterior abdominal wall and formed a mass in the lower part of the pelvis, resembling great coils of intestine. A catheter was left in the bladder for three days and the patient made an uneventful recovery. I have found no report of a similar case in the literature. In one series of cases of injuries to the bladder during operation, collected by the late Dr. A. Reeves Jackson of Chicago, 67 cases reported by forty-two different operators, I found none bearing any resemblance to this one. Some cases of injury are reported in which the bladder had been so uniformly blended with the parched peritoneum that it had been difficult to draw a line and tell just where the cavity ended, and others where it was blended with a tumor that had grown up to the umbilicus; but in all of these the details of closing the bladder laid particular stress upon stretching the peritoneum. Of course, nothing of the kind could be called for in the case I have related, so I think we may look upon such a displacement as unique.

DR. WEST.—The thing that made this woman seek operation was inability to pass urine. This tumor had grown so as to

so compress the neck of the bladder that a nurse could not pass a catheter.

DR. HYDE.—Speaking of this case reminds me of an abdominal section for a case of tuboovarian disease. On cutting through the abdominal wall, I came upon what Dr. Emmet so aptly described as “edematous tissue.” I thought it was thickened peritoneum, but on incising it found I had entered the bladder and had to go above the umbilicus to get to a point where I could enter the abdominal cavity. It was simply a case of a high bladder attachment. There was no distention of the bladder.

DR. EMMET.—You cut through the peritoneum to reach the bladder?

DR. HYDE.—No; I had to extend my incision before I could get into the abdominal cavity. I had cut into the bladder extraperitoneally. It surprised me because it was a simple abdominal incision for tuboovarian disease, and I had not been looking for any high bladder attachment in such a case. With large uterine tumors we would be on our guard.

DR. GRAD.—Dr. West's patient came for operation on account of distention of the bladder. A similar case came under my observation, where a small fibroid was the cause of the retention of urine. The uterus had become so heavy that it retroverted and caused the inability to pass urine.

DR. WEST presented a specimen of

UTERINE FIBROID.

A case operated on about two weeks ago was of interest to me. The woman, about 30 years old, first noticed a slight abdominal enlargement last May. About five weeks before she came into the Hospital a tumor in the abdomen developed rather rapidly. It was removed sixteen days ago. It filled the pelvis, and in the abdomen could be felt under the ribs. A fibroid in Douglas' cul-de-sac lifted the uterus up so that the cervix lay above the level of the pubes.

DR. EMMET.—I think Dr. West had reason to suspect not only degeneration, but malignant change, and the uterus would have been a source of danger to leave. It has been quite common of late to find some suggestion of sarcoma in tumors of this kind if one looked far enough.

DR. WEST.—It has been very carefully examined, microscopically.

DR. W. M. FORD read a paper entitled

CLASSIFICATION OF THE NON-SPECIFIC SURGICAL FEVERS.*

DR. EMMET.—I am convinced of the value of the deductions drawn and of the conclusions enumerated by Dr. Ford as tend-

*See original article, page 66.

ing towards improvement in diagnosis and therapeutics.

While we are of one mind in regard to sepsis, and all wish to be able to distinguish its various forms, I feel that we are not in a position to avail ourselves of these nice distinctions in bacteriological investigations and that we are compelled, for the present, to still rely on information furnished day by day by the pulse, respiration, and temperature, and by the condition of the tongue, skin, kidneys, and feces. In every-day clinical work we undoubtedly meet with cases which may bother us for a while; but the able clinician will have solved the riddle by close observation of the features above enumerated, long before the blood examination will have more than confirmed his knowledge that something is at fault somewhere, and though he may not be in a position to speak definitely for some days, yet he will have met the indications to control excessive pyrexia, to sustain strength, and maintain the good working of the heart.

DR. WEST.—A special tendency of the younger men, whose attention has been called a great deal to examination of the blood, is to make a diagnosis by means of this, which often leads to grave errors.

As a rule, when the blood has reached a condition of danger, we have long since hit on a conclusion by the clinical picture. I do not, however, wish to discourage this blood examination.

DR. GRAD.—I do not know whether I understood Dr. Ford in his definition of pyemia. I was taught that pyemia was due to bacterial infection of the blood; now Dr. Ford calls that active septicemia and he defines pyemia as a condition where there is an infected clot. My idea was that, when the germs had entered the circulation, the condition was termed pyemia. I believe that in certain cases it is a very good thing to make differential counts of the blood; but at the same time we must be very careful in drawing a prognosis from them. Last summer I had some septic cases under observation, one of which I called pyemia, but which I would call in Dr. Ford's classification, active septicemia. It was a condition where one could not determine the source of the infection. The patient was septic for eleven weeks and finally recovered. What, in my opinion, caused the disappearance of the septic process, was the intravenous injection of collargol. I also made the observation that if I injected the solution very slowly, taking, say, one-half hour to inject something like a dram of the solution, I would get much better results. In this way, the pulse and fever would be very much improved for 24, 36, or 48 hours. I take these septic patients out of bed, make them as comfortable as they can be, keep them out in the air or in the sunlight, and give them whatever they like to eat. If they should have a chill and vomit up the entire meal I would give them another meal in half an hour.

DR. BROWN.—What do you mean by injecting the solution slowly?

DR. GRAD.—I use about 2 per cent. solution and take about thirty minutes to inject half a dram.

DR. BROWN.—I cannot help differing from the opinions expressed by Dr. West as to the value of blood examinations in determining the degree of infection. I regard such examinations as of great assistance to the surgeon, giving him information which he cannot obtain otherwise. Sepsis is ordinarily recognized, but the degree of poisoning and its progress, together with the resistance of the patient to its depressing effect, can only be determined by comparative blood examinations. Such comparisons frequently give the operator a clear idea as to when to operate, whether at once or later, or possibly whether to operate at all or not. I speak especially with reference to the differential count. We know that the leucocyte count is a measure of the resisting power of the patient, while the polynuclear count represents the degree of toxic infection. A larger leucocyte count, with a markedly increased polynuclear percentage, represents toxic infection with a good resisting power on the part of the patient. If under such conditions we felt that it might be of advantage to the patient to delay operating, it could be done. If a subsequent count gave a decrease in the polynuclear percentage, we would know that the toxic infection was decreasing, which, taken with the general improvement of the patient, might lead to avoidance of operative measures during the acute stage.

On the contrary, if there was an increase in the polynuclear percentage over the first count, the indications of an increasing toxemia would be evident and a further delay dangerous. Again, a low leucocyte count, with a high polynuclear percentage, indicates a diminished resisting power on the part of the patient, and a grave toxic infection calling for immediate operative measures.

Meeting of March 27, 1906.

REPORT OF CASES, ETC.

DR. BAKER.—I would like to add a supplementary report to a paper I read last year on the "Routine Removal of the Appendix" in all cases where the abdomen was opened. I have been more and more impressed with its importance, and the figures I presented then are fully substantiated by the cases we have had in the last year. That is, about three-fifths of all the appendices removed showed disease.

DR. JESSUP.—In reference to Dr. Baker's remarks, I would add that four years ago I found a primary carcinoma of the appendix removed as a routine at the time of an operation for diseased tubes and ovaries. Only about 15 such cases had been reported then, but in the last two years a large number have been reported, many of them removed in this routine way.

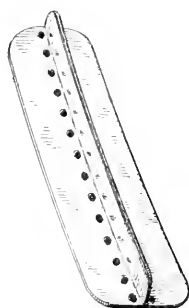
DR. WEST.—I would like to ask Dr. Baker what technique he uses in the removal of these appendices.

DR. BAKER.—I apply forceps on the mesoappendix and cut down to the stump, then burn off the appendix, tie off the mesoappendix, take a few stitches in the stump and down on the mesoappendix.

DR. WEST.—Until within the last year, I had inverted the stump and tied off the mesoappendix, but I found that other men who were doing a great deal more of that work than I, and those in the hospitals, were tying off the appendix with catgut, carbolicizing the stump, and then dropping it back into the abdomen. I have done this in a great many cases since then, and there has been no bad result.

DR. CHAMBERS.—I make a circular incision around the appendix, then strip the peritoneum back to the cecum and ligate with No. 1 10-day chromic gut. Then, after amputating with the thermocautery knife, I draw the peritoneum back over the stump. It is a much quicker method than the purse-string and inversion method and I have never had any but the best results.

DR. CLARENCE R. HYDE.—I wish to present a simple device for the radical cure of vesicovaginal fistula. Its author is Dr. Ernest Palmer, gynecologist to the Long Island College Hospital, Brooklyn. This plate is made of silver, with a median



Dr. Palmer's device for vesicovaginal fistula operations.

ridge at right angles to its surface, over which the sutures are tied. On either side of the ridge is a row of small holes through which to pass the suture ends before tying. The plate has been used in five different cases of vesicovaginal fistula with no failures in the union of the denuded edges nor any resultant fistula. This plate was made especially for perineal work. A larger plate has been constructed for use in the abdomen. For vesicovaginal fistula operations, the plate is made of sheet lead which can be easily moulded to conform to any anatomical peculiarities present.

It is interesting to note that it is not necessary to make the

classical beveled-edge denudation, and that all layers including the mucosa are engaged by the sutures. After the operation, a catheter is inserted into the bladder and the urine allowed to collect in a vessel by the bedside of the patient. The sutures are all removed within two weeks.

The last case operated on is worthy of mention, for the plate had its severest test at that time. The patient was a multipara and was torn during labor by a colpeurynter, the tear extending from a point in front of and including the anterior cervical wall to within an inch of the meatus. Two weeks later she was referred to Dr. Palmer for operation, at which time the wound showed the edges somewhat incrustated with phosphates, and the urine was decidedly ammoniacal. After thoroughly cleansing the field of operation, the cervical laceration was repaired with two chromic catgut sutures. The edges of the fistula were then denuded, no attempt being made to secure any particular style of denudation, and ten silkworm gut sutures were introduced, all including the mucosa. The upper angle suture next to the cervix gave particular difficulty in its introduction, but the remaining nine gave no trouble whatsoever. The catheter was fixed properly and the patient put to bed. During her convalescence she was given a mixture of benzoic acid and urotropin and told to lie in one position as far as possible to prevent the dislodgment of the catheter. The night before the sutures were removed the catheter came out during sleep and remained out for some hours till discovered by the nurse, who replaced it and withdrew five ounces of urine. This was excellent proof of primary union. When the sutures were removed, only a fine linear scar showed.

The plate owes its action to the fact that the sutures pull directly upwards, and, being fastened on the plate, and not on the tissues, do not cut through and thus bury themselves during healing, and so create a fistulous tract for urinary oozing. Further than this, with the plate it is possible to introduce the sutures further from the denuded edges, and thus gain a firmer hold. Again there is a counterpressure exerted on the vaginal surface, which supports the whole line of incision, thus preventing any separation of the different layers of which the wound is composed. Should the bladder become distended through slipping out of the catheter, this separation would not obtain. In a word, the plate obviates the tying of sutures on a soft surface. It permits and demands that they be tied on a resisting one. We all know how difficult it is at times to remove silver wire sutures in the anterior wall after they have cut into the tissues and buried themselves, as they invariably will. With this plate, the scissors' point is run along the side of the ridge and cuts each suture as easily as if it were on a table in front of the operator.

It seems almost heresy to come before the Woman's Hospital

Society with a new operation or device for curing vesicovaginal fistula. I confess that I frankly admitted to Dr. Palmer that the operation would fail, because the mucosa was included in the sutures. The late results were such as to convince me of my error and to completely overturn all the ideas on this subject which I had acquired in my training from the master of plastic surgery in the female. The facts speak for themselves.

DR. CHAMBERS.—This device of Dr. Palmer is very much the same as that of Dr. Bozeman's plate; but instead of the elevated ridge and using the silkworm gut he used the silver wire and fastened it with perforated shot. The doctor is fortunate in having vesicovaginal fistulæ cases to use his plate upon. Formerly one could scarcely enter a ward of the Woman's Hospital without finding a vesicovaginal fistula. Now, owing to improved obstetrics, they are very rare.

DR. WEST.—Where there is a comparatively small fistula, the plate would offer surgical rest to the parts, but in extensive fistulæ running in different directions, such a plate would be perfectly useless.

DR. HARRISON.—The same idea occurred to me as to Dr. West. Catgut and even silk can be used with success, but with fistulæ due to extensive loss of tissue the plate could not cover the line of union, and so would not be applicable in those cases. Still, as Dr. Chambers says, such cases are not seen nowadays.



UTERINE CURETTE.

DR. LANGSTAFF.—I have here a steel uterine curette that I devised to increase its efficiency in reaching the angles of the uterus. It was chiefly designed for removing remnants of conception, but I think it is applicable to any condition where a uterine curette is required. The ordinary curette bears on a point. This one bears on an edge which is parallel with the surface, and I think is a much safer instrument.

DR. CHAMBERS. I am opposed to passing any form of sharp curette above the internal os. I think sharp curettes inside the uterus have done more damage than any other instrument. Anything that ought to be removed by a curette can be removed by the harmless dull form. With the sharp curette one opens up channels for infection. I have seen cases where the fundus uteri was cut through.

DR. D. S. D. JESSUP read a paper on

VALUE OF BLOOD EXAMINATIONS IN SURGICAL DIAGNOSIS.*

DR. HARRISON. There is one disease in which disappointment is felt when relying on the blood count as aid to diagnosis, and that is appendicitis. It was thought that the blood count

* See original article, page 33.

would enable us to determine when there was suppuration. It has been ascertained that in accumulation of pus in the abdominal cavity the blood count will leave us in the lurch. It is possible that the reason is that in a great many of these cases it is due to the encapsulation of the pus.

DR. MALLETT.—This method of diagnosis is of great value in determining hemorrhages. I had a patient come to the Hospital who gave a straight history of an ectopic gestation. She was prepared for operation, but finally declined to have anything done. She was sent back to the ward and all symptoms apparently disappeared. The leucocyte count was 28,000. She wanted to go home. This was not permitted, and although her pulse kept down to 88 and she had no temperature, her abdomen was opened. There was a free hemorrhage into the peritoneal cavity.

DR. JESSUP.—In regard to the uncertainty of the total leucocyte count when taken alone as a guide for operation, it may be said that where the differential is considered with the total count and not too definite a limit is put on the percentage where pus should be considered certain, in most cases the white cell examination will prove a valuable aid in diagnosis. The point that Dr. Mallett brought out with regard to differential counts in ectopic pregnancies is certainly very interesting and instructive. Following hemorrhage the first change to be noted in the circulating blood is an increase of the white cells, and this occurs before the diminution in the red cells is apparent.

DR. W. H. BAKER presented a paper entitled,

A NEW OPERATION FOR ANTEFLEXION OF THE CERVIX.*

DR. HARRISON.—This is a very ingenious operation of Dr. Baker's, and I can readily see that it would correct the deformity. Married women do suffer from dysmenorrhea under such circumstances, almost necessarily, and relief follows the correction of the deformity. In these cases, with a long intra-vaginal portion of the cervix I have always operated by making use of the Schroeder's operation, incising the cervix bilaterally, cutting a wedge-shaped piece the anterior and posterior lips and then uniting the cut surfaces. In all the cases in which I have used this method it has relieved the symptoms perfectly. It acts in much the same manner as Dr. Baker's operation.

DR. CHAMBERS.—I have never approved of Dudley's operation, for the reason given by Dr. Baker, namely, that it mutilated the cervix.

DR. WEST.—I have had several cases of severe dysmenorrhea in which the symptoms were perfectly relieved by amputating the cervix. At the point of flexure there is an unyielding con-

*See original article, page 17.

dition which perhaps has something to do with the dysmenorrhea. In very bad cases, where one might feel justified in deforming the cervix somewhat, a certain amount of this tissue might be excised.

DR. MALLETT.—In performing this operation I would carry the incision up to the internal os, as I have never obtained any permanent relief unless I went as high as that.

DR. FORD.—I would like to ask Dr. Baker if he has any trouble in drawing that needle through the cervix.

DR. BAKER.—I find no difficulty in getting it through the tissues on account of the sharp curve.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of March 2, 1906.

DR. KELLEY reported a case of

PAPILLOMA OF THE OVARIES,

and exhibited the specimen. Mrs. X. Family history: Mother and father living and in good health. Patient was born in Germany twenty-six years ago. Had the diseases of childhood. Came to America when she was 15 years of age. Menstruated at the age of 18 years. Was always apparently healthy and strong. At the age of 21 years she was married to a man who boasted that he had had gonorrhea for fifteen years. One year from date of marriage she had a miscarriage; from that time she began to suffer from dysmenorrhea. Previous to this her menstrual period had been regular and free from pain. Examination on February 26 showed a large mass in the pelvis and the uterus was pushed forward. Was taken to hospital on February 28 and operated upon March 2. On opening the abdomen two cysts were exposed and a small papillomatous excrescence was seen where the bladder was adherent over the uterus. The uterus was entirely covered with the growth and bladder. The uterus and appendages were removed.

DR. MILLER said that papillomata of the ovaries were classed among the semi-malignant tumors. If removed early, before rupture and implantation upon the peritoneal surfaces, they did not, as a rule, recur. After the implantation occurred the patients generally lived several years, but finally died as a result of the growth. He has a case under observation who was

operated upon by Dr. H. L. E. Johnson, four or five years ago, who found it impossible to remove the growth. She suffers with accumulation of fluid in the peritoneal cavity which has to be removed every five or six months, but the woman is in as good condition now as when he first saw her, three years ago. He recalled another case where the woman lived fifteen or sixteen years after the discovery of the tumor. She had several exploratory operations by as many different gynecologists, each believing before operation that the tumor could not be malignant, on account of its history of long duration.

DR. STONE asked the definition of malignancy of tumors. Carcinoma and sarcoma should not be considered the only malignant tumors. He remembered cases of papillomas where one ovary was originally involved and where the growth afterwards involved the uterus and the other ovary. The Mayos advocate the removal of both ovaries and the uterus where one ovary is the seat of the cyst. Carcinoma and papilloma are as frequent in the negro race as in the white in contradistinction to the ordinary ovarian cyst. He recalled a case which had been abandoned by Dr. Howard Kelly. He made an exploratory incision and found all the abdominal organs glued together, but there was no appearance of the papillary excrescences.

DR. J. T. JOHNSON asked if the essayist believed there was any connection between the papilloma and the gonorrhea which the husband had had for so many years.

DR. CARR said that he believed that most ovarian tumors came from irritation, and he thought possibly gonorrhea had something to do with the origin of the growth. The best distinction between malignant and nonmalignant tumors was whether they would recur or not. The tumor was interesting because it would, at times, degenerate into a true cancer.

DR. ABBE said that malignancy means that the tumor will, by its own growth, and not by metastases, end the life of the patient. Would these tumors end the life of the patient by their own growth?

DR. SOTHORON read the essay of the evening,

JUDGMENT AND TECHNIQUE IN LABOR.*

DR. MORAN said that obstetrics should be in the domain of surgery. To reduce mortality and morbidity the patient should be watched during pregnancy. It should be possible to recognize threatened eclampsia, placenta prævia, and the position of the fetus before labor begins. One could generally determine the presentation by external manipulation. Internal examination might be necessary, but might often be avoided. At times, the only thing which could be determined by the vaginal

*See original article, page 50.

examination was the amount of dilatation of the cervix. It was well to limit vaginal examination as much as possible. The patient could usually be allowed to go until the waters ruptured, when an examination should be made. When the labor was progressing normally the only thing to do in protecting the perineum was to restrict the descent of the head and allow the perineum to take care of itself. The essayist's advice as to delivery of the after-coming shoulders was in accord with his views. It was a temptation to deliver the shoulders too quickly, and many lacerations were produced by this. In the third stage of labor a good indication was not to attempt to express the placenta until the fundus rose towards the umbilicus. Before this any attempt to deliver the placenta by Credé's method was likely to fail because the placenta would not be detached. To sum up, pelvimetry, determining the relative size of head and pelvis by pushing the head into the pelvis in the latter part of pregnancy, and cleanliness, constituted good obstetrics.

DR. MORSE said that in a paper read by him sometime ago, he deprecated the use of bichloride of mercury solution as a compress to the perineum. It was an astringent and its use predisposed to lacerations of the perineum.

DR. FRY said that the essayist spoke of careful cleansing of the hands and genitals of the patient, but did not mention the use of a sterile gown. He also criticised the use of the towel saturated with bichloride solution to press on the perineum. It stimulated uterine contraction and predisposed to edema. One should confine his attention to the child's head by restraining its advance. There also should be a little delay after the birth of the child before attempting to express the placenta. He advised also against following the cord up with the finger and thought it hazardous to introduce the finger into the vagina after birth. It was a great mistake to let the woman wear herself out without aiding her. The os might be too far back, and by hooking the finger into it and pulling it forward one might frequently hasten delivery. Again, in a slow dilatation of the os the head frequently fitted so closely in the pelvis that the water could not get by, and by pushing up the head and allowing the fluid to descend the delivery might be hastened. The dangers of internal examinations were nothing compared to the benefits to be derived from them. A cause of tardy dilatation might be adhesions between the membrane and the uterus. By sweeping the finger around and breaking up these adhesions delivery could be hastened. In the second stage the vaginal examination showed the progress of flexion and rotation. By manual rotation labor could often be materially shortened. In occipito-posterior positions, manual rotation was most satisfactory. Forceps had done much to injure scientific midwifery.

DR. ACKER believed that we should make fairly frequent examinations. They were a help in both the first and second stages of labor.

DR. J. T. JOHNSON thought that many cases of retroversion were due to keeping a woman on her back for several days with a tight binder around the abdomen. He did not agree with the essayist in the delivery of the afterbirth. There was much less likelihood of infection by the use of Credé's method.

DR. SOTHORON said that he would hook his finger into the placenta only when it was in the vagina. He thought Dr. Fry's advice to attempt to change occipito-posterior into occipito-anterior position would tend to cause bad results.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF LONDON.

Meeting of May 2, 1906.

The President, DR. DAKIN, in the Chair.

DR. LEWERS read a short communication on

THREE CASES OF EPITHELIOMA OF THE VULVA.

CASE I.—A multipara, aged 47, had a squamous-celled carcinoma removed from the right side of the vulva on December 7, 1896, and the lymph nodes in the right groin were removed at the same time. A small growth reappeared on the left side of the vulva about two years later and was removed in December, 1898. In January, 1899, the lymph nodes in the left groin were removed. A small growth reappeared on the left side of the vulva and was removed on March 9, 1901. Since that time the patient had remained quite well. She was examined and found free from recurrence on March 8, 1906, over nine years since the first operation, and almost exactly five years since the date of her fourth and last operation.

CASE II.—A multipara, aged 52, had a squamous-celled carcinoma of the clitoris removed on September 1, 1899. The lymph nodes were at the same time removed from both groins. The patient was known to be well and free from recurrence on March 11, 1906.

CASE III.—A multipara, aged 34, was operated on for a squamous-celled carcinoma of the vulva on March 31, 1905. She was eight months pregnant at the time. Labor came on four days later and she was delivered naturally of a living child. On May 4 the lymph nodes in both groins were removed. The disease rapidly recurred in the same place, and the growth was again removed on June 20. The growth again recurred soon afterwards and she underwent the X-ray treatment from August

11 to September 9 without benefit. She died three months afterward.

Attention was directed to the fact that local recurrence in cases of epithelioma of the vulva is not necessarily of unfavorable significance, as illustrated in the first case. Case III was remarkable in being an example of epithelioma of the vulva occurring in a patient no more than 34 years of age and in being complicated by pregnancy. In this case the growth ran an exceedingly rapid course, which might possibly have been due partly to the pregnancy and partly to the fact that the patient was only 34; the author considered that removal of the growth by the Paquelin cautery was a better method than removal by the knife.

MRS. STANLEY BOYD referred to cases on which she had operated for epithelioma of the vulva in which eleven years had elapsed without recurrence after a second operation. In another case the patient remained well for nine years and then reappeared with recurrence in the scar. She preferred removal of the growth by the knife with suture to the use of the Paquelin cautery. She had not always removed the inguinal glands, unless they were obviously enlarged.

DR. HERBERT SPENCER referred to cases he had operated on, one remaining well for eight and a-half years, another for three years. In another case several operations had been performed, and the patient now, thirteen years after the first operation, had recurrence in the pelvic lymph nodes. He advocated removing the whole of the vulva, in order to get rid of the leukoplakial skin. He also thought it well to remove the inguinal lymph nodes, but thought that their complete removal was practically impossible.

DR. INGLIS PARSONS stated that, in view of the fact that cancer could be inoculated, he considered that removal by the cautery was by far the best method, and it had, in his hands, given much better results than removal by the knife.

SIR WILLIAM SINCLAIR gave a demonstration on the use of laminaria tents. He showed a large number of specimens of the material from which the tents were made, illustrating the various stages in their manufacture. The specimens of laminaria exhibited were obtained from islands on the west coast of Scotland, from Coll and Iona and others. He considered the laminaria from the district mentioned superior to that hitherto in the market. He had observed with regret how much the use of laminaria tents for dilating the cervix had gone out of fashion, as he considered dilatation by the use of tents far superior to that obtained by the use of rapid dilators. Very serious results were apt to be produced by rapid mechanical dilatation, more especially in the hands of those with little gynecological experience.

DR. HEYWOOD SMITH said that larger tents were made by pegging together sections of the material, a process which might

cause irregular dilatation, or even lead to breaking up of the tent. He was glad to see, from the specimens shown, that it would be possible to obtain tents as large as could be wanted in a single piece.

DR. BOXALL remarked that the main objection offered to the use of tents was their inherent possibility of infection, but by dry heat laminaria tents could be not only sterilized, but improved in quality, a process which could be accomplished, if necessary, in the domestic oven.

DR. HERMAN did not think laminaria was as much out of fashion as Sir William Sinclair supposed. It had been used for thirty years or more in the London Hospital. He did not like tents made of several pieces of laminaria glued together, for the glue was very possibly septic. He was surprised to hear anyone say that the dilating force of laminaria was weak; for Matthews Duncan had shown that laminaria was capable of exerting a force of 640 pounds to the square inch.

DR. INGLIS PARSONS thought that on the whole dilatation with metal dilators was preferable to dilatation by tents.

DR. W. GANDY said that some years ago he used nothing else but tents to dilate the cervix, and he felt that with ordinary care no harm could befall the patient.

DR. HERBERT SPENCER was surprised at Sir William Sinclair's statement that laminaria tents had gone out of fashion. They had been used continuously at University College Hospital for the last twenty-five years. He could not imagine that any gynecologist would dilate a rigid senile cervix rapidly in order to explore it with the finger.

DR. LEWERS said it was important to bear in mind the degree of dilatation of the cervix required in choosing between dilatation by the rapid method and by the laminaria tent. In many cases it was certainly impossible to dilate the cervix sufficiently by the rapid method to allow of the introduction of the finger into the uterus without causing laceration. It had to be borne in mind that when a laceration occurred it could not be limited in any way at the will of the operator. It might be a slight and unimportant laceration, or it might extend right through the uterus into the broad ligament or peritoneal cavity. As a rule, Dr. Lewers used tents the day before he required exploration, and then under an anesthetic, if necessary, passed a few sizes of Hegar's bougies.

REVIEWS.

PRACTICE OF GYNECOLOGY. In original contributions by American authors. J. WESLEY BOVÉE, M.D., J. RIDDLE GOFFE, M.D., G. BROWN MILLER, M.D., GEORGE H. NOBLE, M.D., BENJAMIN R. SCHENCK, M.D., THOMAS J. WATKINS, M.D., and X. O. WERDER, M.D. Edited by J. WESLEY BOVÉE, M.D., Professor of Gynecology, George Washington University, Washington, D. C. Pp. 836, with 382 engravings and 60 full-page plates. Philadelphia and New York: Lea Brothers & Co., 1906.

Owing to the number of writers each individual subject is fully treated, but the arrangement is quite different from that which one generally finds in similar works. Tumors and inflammations, for instance, are not grouped collectively, but each organ is separately described, beginning with its anatomy, histology, and then taking up the etiology, bacteriology, pathology, symptoms, and treatment of various diseases. Beginning with the different methods of examination of the pelvic organs for diagnosis a résumé of embryology is given, showing how the anomalies of each organ develop. In treating uterine retro-displacements the many operations are compared, from Alexander's and the various intraabdominal procedures to the newest, namely the shortening of the round ligaments through the vagina, and especially the shortening of the uterosacral ligaments according to Goffe and Bovée. The chapters on fecal and urinary fistulæ are full and exhaustive, giving all the operations up to the latest. Noble's new operation for complete laceration of the perineum has several advantages, namely, less liability from infection from the rectum, avoidance of rectal stitches, applicability to deep lacerations, lack of subsequent distortion of the vagina, general success and freedom from difficult technique. The writer also shows a new operation for rectocele. The surgical treatment of enuresis is a new branch of gynecology, and though limited to intractable cases, the author's experience shows that in well-selected cases relief can be obtained. The bacteriology and pathology of the different inflammatory conditions are carefully described and the various pathological changes are fully illustrated. Tumors, benign and malignant, are treated in the usual way. The technique of operations by the vaginal and abdominal routes is thoroughly aseptic and all the necessary steps are given in detail. It is claimed that the vaginal route is becoming more and more popular with gynecologists, and that it can be used in most cases. One author advocates the through-and-through method of suturing in suprapubic operations, one not used by most surgeons,

and certainly not the best. The care of simple, uncomplicated cases is entirely omitted in the after-treatment of operations, a subject which is very important and should receive recognition. The surgical conditions of the rectum and anus are described, as well as those of the kidney and ureter. Surgical complications of the intestines, and especially of the appendix, are omitted. The gynecologist of to-day is not limited to the pelvic organs, and he must be prepared for emergencies, and in other words be an abdominal surgeon. Plastic surgery and operations through the vagina are main features of the book, being fully described, and each successive step is amply illustrated.

The text is well written and varied by the citation of cases by the authors. Some chapters are not so full as in other books of its class, but most of the important points are brought out. The illustrations and plates are well chosen, most of them being original, though many are borrowed, especially from Dudley. The volume is a good book for the gynecologist and a handy reference work for the surgeon and general practitioner.

P. V. K. J.

A TEXTBOOK ON THE PRACTICE OF GYNECOLOGY. By WILLIAM EASTERLY ASHTON, M.D., LL.D., Fellow of the American Gynecological Society, Professor of Gynecology in the Medico-Chirurgical College, Philadelphia, etc. Pp. 1,079, with 1,046 illustrations. Philadelphia: W. B. Saunders Co., 1906.

Little need be said of this volume. The second edition following so close upon the first proves conclusively the necessity of such a work and the appreciation of the profession. The changes are few and, with slight variations in the text, consist mainly in improvement of the illustrations. It fulfills the author's object, being a complete textbook for the general practitioner and medical student, and is written in a style simple and thorough.

LE RÉTRÉCISSEMENT CONGÉNITAL HYPERTROPHIQUE DU PYLORE CHEZ LE NOUVEAU-NÉ. Par le Dr. F. SARVONAT. Paris, Lyon, A. Malouir: 1905.

This monograph represents a careful compilation and study of all the cases of congenital hypertrophic stenosis of the pylorus that have thus far been reported. Separate chapters are devoted to the history, etiology, symptomatology, diagnosis, pathological anatomy, prognosis and treatment, and the work concludes with a tabulated study of all the hitherto reported cases, to the number of 112. Of historical interest, it may be noted that the first case was reported in America by Beardsley as far back as 1788. The trend of opinion appears to be that the disease is a congenital malformation, consisting in a hypertrophy of the circular muscular layer of the pylorus. The most important elements in the diagnosis are the uncontrollable vomiting, evidences of stomach dilatation, visible peristalsis, and especially the presence of a pyloric tumor. The latter is fortunately

present in the vast majority of the cases, rendering the diagnosis comparatively easy. Peculiarly enough, the symptoms do not, as a rule, appear immediately after birth, but in the second and third weeks, or even in the second month. The cases are tabulated by the author according to the treatment to which they have been subjected. Of all the operative measures that have been recommended, gastroenterostomy, pyloroplasty, Loretta's operation and pylorotomy, the best results have been obtained by gastroenterostomy, and Sarvonat concludes that this should be the operation of choice.

E. M.

TRAVAUX D'OBSTÉTRIQUE. Par le Docteur LÉON VALLOIS, Professeur agrégé d'accouchements à la faculté de médecine de Montpellier. Pp. 412. Avec 11 planches; Montpellier, Coulet et Fils; Paris, Masson et Cie.: 1905.

The volume is a collection of thirty-two obstetrical studies that have been published by the author since 1892. It is divided into two parts; the first relates to problems of pregnancy and delivery, the second to some physiological and pathological aspects of the newly born. Of the more important studies in the first part we may mention: Study on occipito-posterior positions; the use of forceps in brow presentations; the application of forceps in contracted pelvis; on the lateral inclination of the gravid womb; a description of a method permitting the determination of the pressure exercised by the fetal membranes and the intensity of the uterine contractions; researches on syphilis of the fetal membranes and placenta, and the treatment of eclampsia. The second part consists of six studies, the most important of which are: researches on the respiratory movements of the fetus; on the diameters of the fetal head at term; syphilitic lesions of the bones, and a case of symmelia. The articles, as a whole, represent sound and painstaking work. It must be confessed, however, that there is little of originality in this volume. The study that perhaps bespeaks most originality is that on the determination of the pressure exercised by the membranes during labor; the apparatus described is very ingenious, but we see little in it of practical value. One of the largest and most important studies is that on occipito-posterior positions. From the author's own statistics of 2,000 cases, the percentages of the various positions is as follows: L. O. A., 65.95; R. O. P., 33.5; L. O. P., 0.45; R. O. A., 0.15. These percentages notably differ from those which we are commonly taught. The author advocates rotation of the head in occipito-posterior positions, with a cephalic application of the forceps, preferably of the Tarnier model. In regard to the use of the forceps in brow presentations, the author emphasizes the primary necessity of obtaining a firm hold on the head, by a cephalic antero-posterior application. The treatment of eclampsia and the hygiene of pregnancy are discussed along well-recognized lines, although in the latter, douches in the last couple of months are advocated.

E. M.

BACTERIOLOGISCHE UNTERSUCHUNGEN ÜBER HANDE-DESINFEKTION UND IHRE ENDERGEBNISSE FÜR DIE PRAXIS. (Bacteriological studies on disinfection of the hands, and their practical bearing.) Von Dr. Med. O. SARWEY, A. O. Professor in Tübingen; mit 4 lichtdrucktafeln; Berlin, August Hirshwald; 1905.

According to the writer, the ordinary methods of testing the efficiency of any method of sterilization of the hands are fallacious; Sarwey has devised a more rigid procedure of his own, which aims to exclude any possibility of error or misinterpretation. With this procedure Sarwey has found that all the methods that have thus far been devised for the sterilization of the hands fail in ever attaining an absolute germ-free state. The greater part of this monograph of 98 pages is polemical in character, and is devoted to a condemnation of the hot water-alcohol method of Ahlfeld. The author finally concludes that the best method of accomplishing sterilization of the hands lies in the use of rubber gloves.

E. M.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS

Purin Bodies in the Urine of Pregnant and Puerperal Women.—Andrea Boni (*Ann. di Ostet.*, January) describes his examinations of the urine of pregnant and puerperal women as to the presence of nitrogen and diminution of urea. Examinations of the urine of eight women were systematically made while all were on the same diet. The results are as follows: there is a little less nitrogen eliminated than normal in both pregnancy and the puerperium. Uric acid is in nearly normal amount. The nitrogen of purin bodies diminishes gradually. The purin bases are a little less than in a normal state. The nitrogen in uric acid is a little greater than normal. The nitrogen of the purin bases is less than normal, and represents a very small portion of the total nitrogen excreted.

Urine in Normal Pregnancy.—Frank S. Matthews (*Amer. Jour. Med. Sci.*, June) finds that the urine of the pregnant woman, normally and with great constancy, has a specific gravity considerably lower than that of the non-pregnant. The average of all his determinations in the pregnant cases, about 100 women, was 1.013. The highest averages were 1.018, some as low as 1.006. Not more than three specimens were examined in any case. This low specific gravity is due to two conditions: 1. The pregnant woman during these months excretes rather more urine than the non-pregnant. 2. The nitrogen elimination is diminished. Three hundred grains of urea (determined by the hypobromite method) is above the average toward the end of

pregnancy. This is in part explained by the body's retention of nitrogen and perhaps in part by variations in the pregnant woman's diet.

Hematology of Pregnancy and the Puerperium.—J. C. M. Given (*Jour. Obst. and Gyn.*, April) observes that there is a slight leucocytosis during the last months of pregnancy. This becomes well marked immediately after labor, probably commencing during labor, as shown by Hahl and others. The leucocytosis is a polymorphonuclear increase and rapidly falls to normal in a few days succeeding labor. He finds this condition exists equally in primiparæ and multiparæ and occurs in full-time or premature labor. When the child is dead before labor commences, or in renal inadequacy, it is only slight. It is uninfluenced by chloroform and other drugs. There is a well-marked increase in the lymphocytes, commencing a few days after delivery and very marked during the second and third weeks; this is synchronous with, and probably caused by, the involution of the uterus. The more marked this lymphocytosis is, the better the patient is doing and the more rapid will be her return to health.

Arterial Tension in Pregnancy and the Puerperium and in Eclampsia.—M. H. Vaquez (*Bull. de la Soc. d'Obst. de Paris*, Feb. 15) states that as a result of his researches he finds that the arterial tension remains normal in pregnancy until near the termination of labor, and rapidly returns to normal after labor ends. The elevation of tension at the time of labor is not steady but in leaps, while the fall is sudden and complete. In eclampsia the radial pulse is hard, vibrant and tense. This rise of tension is of prognostic and diagnostic value. It may occur in cases without albuminuria, and may not be present when large amounts of albumin are found in the urine. Its presence indicates the imminence of an attack of convulsions. Every woman who presents a raised arterial tension is menaced by convulsions; the persistence of tension during an attack indicates renewed seizures. Cure cannot be expected until the tension is lowered.

Chemistry of Toxemias in Pregnancy.—C. G. T. Wolf (*N. Y. Med. Jour.*, April 21) is of the opinion that it is futile to attempt to explain the etiology of pernicious vomiting through the medium of acid intoxication. Any attempt to recognize or to diagnosticate degrees of the disorder through an examination of the urine for ammonia, for acetone, aceto-acetic acid, or bioxybutyric acid is lacking the support of any thoroughly sound physiological experimental groundwork.

Hyperemesis Gravidarum.—William S. Stone (*N. Y. State Jour. Med.*, May) bases his line of treatment of this condition upon the assumption that the essential etiological factor is a toxemia. Therefore, he attempts to cut off the supply of toxins, or of material suitable for their development; to stimulate those organs largely employed in maintaining normal meta-

bolism; to aid the excretion of the toxins and lastly to dilute the toxins in the blood. To obtain the above results treatment should consist of: (1) Rest in bed; (2) exclusion of all visitors, even members of the family; (3) a milk or broth diet or absolute withdrawal of all food by stomach but with a liberal allowance of water; (4) catharsis at the beginning of treatment with calomel and salines; (5) colonic irrigations with normal saline solution and intravenous infusions in the severest types; (6) nutrient enemata; (7) opium hypodermatically or by rectum. In the presence of urinary changes that denote a serious disturbance of metabolism it is the writer's opinion that pregnancy should be terminated at a much earlier period than usual. Rapid dilatation and emptying the uterus under a general anesthetic is a serious operation in these cases and should not always be attempted. The writer believes that the use of laminaria tents might prove an ideal method of interrupting pregnancy in these cases.

Pyelitis in Pregnancy.—Edwin B. Cragin (*Surg., Gyn., and Obst.*, May) gives the predisposing cause as lowered vitality of the ureter and kidney due to compression of the ureter by the pregnant uterus. The exciting cause is usually infection by the colon bacillus. The infection of the urinary tract is often preceded by some disturbance of the intestinal tract. The infection is probably hematogenous, and the compressed and dilated urinary tract, with vitality lowered above the point of compression, becomes the seat of infection. The typical pyelitis of pregnancy is a descending infection. This condition is accompanied by pain and tenderness in the region of the kidney and ureter involved (usually the right), a rise of temperature, rigor, irritability of the bladder, and an acid urine containing pus and usually colon bacilli. In the treatment one must diminish the pressure on the affected urinary tract as far as possible and disinfect and flush it. Urotropin, gr. v. every four hours, and large draughts of water give excellent results in most cases. If, in spite of the above treatment, the pyelitis fails to improve and the fetus is viable, interrupt pregnancy. A patient who shows any signs of a former pyelitis should be strongly advised against becoming pregnant again.

The Use of Roentgen Rays in the Diagnosis of Extrauterine Pregnancy.—Florus Lichtenstein (*Münch. med. Woch.*, March 13) states that in some cases of extrauterine pregnancy, when the fetus is of such a size that the bones have become ossified, as in the case of a mummified fetus, the use of the X-rays is of value in making the diagnosis. In the case which he describes the patient appeared to have reached the eighth month of pregnancy, and had been having uterine bleeding for some days. The child was dead. The uterus was retroposed, the os not dilated, and sound showed that the uterus was empty. In front of the uterus was a mass in which nothing could be dis-

tinctly felt. In the X-ray plate the bones of a lower extremity were visible on the right side of the pelvis, and on the left were three ribs. A laparotomy showed the diagnosis of mummified fetus to be correct. Without the aid of the X-ray plate the diagnosis would have been difficult, as it might have been mistaken for a pregnancy in a double uterus or pregnancy complicated with a movable fibroid. In a normal pregnancy the thickness of the membranes and the amount of amniotic fluid present make the X-rays useless. In extrauterine pregnancy the envelopes are much thinner and little amniotic fluid is present.

Third Stage of Labor.—G. F. Blacker (*Lancet*, Apr. 14) thinks the third stage of labor is best treated by employing the Credé method of expressing the placenta, after a sufficient interval of time has been allowed to elapse for the placenta to become separated. The tendency to shorten this period to much less than thirty minutes is attended with considerable risk to the mother. After the change in the level of the fundus takes place, indicating that the separation of the placenta has occurred, from 10 to 15 minutes should be allowed to elapse so as to diminish the risk of the retention of part of the membranes. If the placenta fails to separate from the uterus there is no harm to the mother in waiting from one-half to two hours for its spontaneous separation and expulsion. Manual removal should never be performed if it can be avoided. Retained portions of placenta and membranes should be removed at once, unless, in the case of the membranes, they are of quite small size.

Forceps, Version, and Craniotomy.—George T. Brodhead (*Ann. Gyn. and Ped.*, Feb.) prefers the high forceps operation to podalic version in cases with normal pelvis and fetal head measurements, and especially when the head is relatively large, and when labor has been protracted, with early escape of amniotic fluid. The axis traction forceps of Tarnier is the instrument to be used. The writer's rule in normal labors is to use the forceps, if after one or one and a half hours there has been little or no advance, in dry labor after one hour in the second stage, if there is no advance. There are many cases where, by an early and intelligent use of the forceps, laceration of the perineum may be avoided. The operation of forceps rotation for occipito-posterior positions is entirely feasible and of great practical importance. Cephalic version is to be undertaken only before the amniotic fluid escapes, prior to or during the early part of labor. It is performed for such malpresentations as face, brow, shoulder, transverse and breech presentations. Combined cephalic version is indicated in only shoulder presentations. Internal podalic version, by far the most frequently used, is indicated in malpresentations, deformed pelvis, prolapsed cord, uterine inertia, eclampsia, placenta prævia, etc. When there is no need of haste, one foot, preferably the anterior

should be brought down; both feet may be seized if there is need of haste and the cervix is dilated. Version and forceps are elected in many cases where craniotomy would be attended by far better results. Use of the cephalotribe is attended by less danger than a protracted forceps operation or a difficult version. The author makes a strong appeal for its more frequent employment when the child is dead.

Cesarean Section for Placenta Prævia.—W. A. Briggs (*Four. Amer. Med. Assn.*, May 12), in cases of central placenta prævia, advises elective Cesarean section of Sãnger type at the moment of greatest viability of the fetus compatible with least danger to the mother. In case the fetus is dead and labor does not set in spontaneously, it should be induced after placental circulation is shut off. In emergency cases, when the patient is not exsanguinated, with presumably clean or superficially infected uterus, the Sãnger-Cesarean section should be done. The Porro operation is indicated if the uterus be positively and deeply infected: (a) In cases of total placenta prævia, with (1) undilated and undilatable cervix, (2) cancerous or fibroid cervix, pelvic tumors, pelvic contraction or other obstacles to the usual obstetric procedure, (3) ruptured sac with escape of amniotic fluid and presenting but undescended head; (b) in cases of lateral placenta prævia with living child, uncontrollable bleeding, and either (1) undilatable cervix or other obstacle to the indicated obstetric procedure, or (2) ruptured and emptied sac with presenting but undescended head. Hemorrhage may be prevented by giving ergot hypodermically ten minutes before operating, compressing the abdominal aorta as soon as the child is delivered, grasping the neck of the uterus low down and firmly compressing the uterine arteries or by Faradic stimulation of the uterine muscle. In the after-treatment purgation should be avoided; colon injections of saline solution may be given at intervals of from three to eight hours. The bowels should be moved by enemata. On the first evidence of uterine infection, prompt and energetic measures of local disinfection should be instituted by means of antiseptic exosmosis and drainage.

Cesarean Section Repeated in the Same Woman.—A. Fruhinsholz (*Ann. de Gyn. et d'Obst.*, March, discusses whether the adhesions of the uterus to the abdominal walls, which are often found after a Cesarean section, constitute a danger to the mother sufficient to contraindicate leaving the uterus after the first section. He concludes that this operation practiced three or more times on the same individual is legitimate, and is even to be recommended on account of the very advantageous results to the child. Such adhesions being contracted immediately after labor leave the uterus in a more normal position than those contracted after operation to fix a nonpregnant uterus to the abdominal wall, since the latter often change the position

of the uterus. From the majority of published observations it is shown that the fecundity of the woman is not lessened by the operation. The risks from adhesion are to be considered, but they are not so great as to outweigh the value of the operation.

Rupture of the Cicatrix of a Cesarean Section in a Later Pregnancy.—A. Couvelaire (*Ann. de Gyn. et d'Obst.*, March) has collected eight published cases of rupture of the cicatrix in pregnancies after Cesarean section and discusses the causes. He cites the anatomical condition of the cicatrix, the uterine distention and the insertion of the placenta over the site of the cicatrix as possible factors in the etiology of rupture. The rupture occurs during the last two months of pregnancy, and is more apt to occur when there is unusual distention, as in twins or hydramnios. The site of the placenta has frequently a less thickness than the other parts of the uterus. At the same time the insertion of the placenta on the site of the cicatrix with its lessened muscular activity may aid in rupture. In the published observations there was a thinning of the muscle at the site of the cicatrix, while the cicatrix itself became thinned, sometimes to the thickness of paper. At the same time the cases of rupture are rare. There is necessity of a careful watching of the patient for the last two months, since an immediate operation is necessary should rupture occur. The author believes that infection of the wound may cause thinning of the cicatrix; hence cases without infection are favorable ones for a strong cicatrix. The suture should be in two planes, so as to prevent rupture. The first symptom is pain, and an immediate laparotomy with removal of the uterus is indicated.

Rupture of the Uterus.—Thomas Hunter (*Lancet*, March 17) reports a case of rupture of the uterus with escape of the child into the abdominal cavity. It was found to be inadvisable to perform laparotomy, so a hand was passed through the rent in the uterus and the legs of the child were brought down until the head could be felt. It was found to be hydrocephalic and was perforated and delivered easily. The abdominal cavity was washed out with salt solution and a gauze drain passed through the uterine tear into the abdominal cavity. The patient recovered.

Penetrating Wounds of the Gravid Uterus.—Giuseppe de Creschio and Luca di Napoli (*Gior. d. Ass. Nap. di Med. e Nat.*, Jan. and Feb.) have demonstrated, by experiments on bitches, animals which are very tolerant of operations, that wounds of the gravid uterus, even when made under the most aseptic precautions, always cause interruption of the pregnancy soon after the wound is received. The entrance of a considerable amount of amniotic fluid into the peritoneal cavity seems to have no unfavorable effect, no peritonitis resulting. The animals all recovered from the wounds, and when killed it was found that the uterine wounds were completely healed in a normal manner.

The authors also collected, from literature, 40 cases of wounds of the gravid uterus, to which they add two cases observed by them. In all these cases it was found that the wound caused interruption of the pregnancy. Hence we may regard it as proved that a wound of the gravid uterus will result in the loss of the life of the child unless it is very near the time of normal delivery. This fact has some grave medicolegal bearings.

Puerperal Sepsis.—S. Marx (*Mcd. Rec.*, Apr. 28) maintains that practically all cases of puerperal septic infection arise from ulcers in some part of the genital canal. He places these ulcers in two classes: (1) desquamative and (2) exudative. When an ulcer is visible it should be cauterized with pure carbolic acid and the action of this stopped in a minute or two by alcohol. This is repeated every twenty-four to thirty-six hours. A strip of gauze is introduced within the parts to keep them separated, and douches are given regularly. When the ulcerations are confined to the lower genital tract the uterus is not to be invaded. When foul discharges, high temperature, and relatively slow pulse are present, meaning intrauterine sapremia, we are justified in exploring for retained products of conception. These being removed, the uterine cavity is swabbed out with pure carbolic acid, packed with pure alcohol-gauze surrounding a large drainage tube. Into this tube, and thus keeping the intra-uterine gauze moist, are injected from four to five ounces of alcohol every three or four hours. An ice bag over the uterus and a large dose of ergot complete the treatment. In this class of cases overactive treatment is to be avoided. In preventing septic condition in normal women we should limit our endeavors to the external genitals, no ante-partum douches or vaginal toilet being permissible. When from bacteriological examination or clinical demonstration we find the vaginal discharge pathological, we should anticipate labor by appropriate treatment; and if, when labor sets in, the discharge is not normal, surgical scrubbing such as are done prior to major vaginal work are distinctly called for. In cases known to be septic, uterine douches after labor are of no service, but we should attempt to limit the infection by packing the uterus with iodoform gauze, which causes firm contraction of the uterus and also inhibits the growth of bacteria.

One-Child Sterility.—Frank S. Mathews (*Surg., Gyn. and Obst.*, May) believes that one-child sterility is almost certainly due to a condition of the female rather than of the male. It is not the result of congenital conditions such as anteversion or narrow os. Gonorrhea is the most frequent cause of this condition; a second, but much less frequent one, is sepsis. A third cause is retroversion or flexion of the uterus. Subinvolution, cysts of the ovaries, tumors, and severe general disease are among the other causes. This condition is as frequent as absolute sterility.

Contraindications to and Impossibility of Lactation.—H. Bouquet (*Bull. gén. de Thér.*, Jan. 15 and 30) states that we are constantly reiterating that the mother must nurse her infant, and yet there are several conditions in which lactation is either impossible or is unwise. He divides these conditions into contraindications and impossibilities. The contraindications are infections and intoxications of the mother which the physician must diagnosticate. Such are valvular heart disease in some cases, albuminuria of Bright's disease, tuberculosis, in which toxins from the milk may be absorbed by the infant, acute infections of long duration, such as typhoid, and local affections of the breasts which would cause the infant to take in pus with the milk. Alcoholism in the mother causes indigestion in the child, convulsions and stigmata of degeneration. Lead, arsenic, and mercury may also cause damage to the child. Impossibilities of lactation are caused by the extreme poverty of the mother who must go out to work to support her infant. These are social, and are best met by the *crèche* and the diet kitchens for nursing mothers. Anatomical impossibilities result from the absence or deformity of the nipple. Physiological impossibility consists of an almost complete absence of milk in the breasts.

GYNECOLOGY AND ABDOMINAL SURGERY.

Post-Operative Tetanus.—Ed. Martin (*Zent. f. Gyn.*, April 7) details a case of tetanus occurring after colporrhaphy and vagino-fixation, and questions what was the source of the tetanus germs. It seems possible that the germs were in the vagina at the time of operation and were not removed by the most careful cleansing. The infection could not have come through the suture material, because the same was used in two other cases which had no symptoms of tetanus. One hundred white mice were inoculated with secretion from the vaginæ of patients and in no case was any symptom of tetanus produced. Therefore, if this germ was in the vagina it must be there but seldom. Such cases are very rare in literature.

Retroflexion and Vibration Massage.—Kurt Witthauer (*Münch. med. Woch.*, Nov. 21, 1905) says that retroflexion has been a bone of contention among gynecologists for many years. According to some it should be treated by operation only. According to others its symptoms depend in great part on the nervous condition of the patient. In hysterical subjects a simple reposition of the uterus will have a wonderful effect. The symptom most complained of is backache, due to pressure of the body of the uterus on the pelvic nerves, the pain becoming greater at the menstrual period when the congestion makes the organ heavier. Yet we find retroflexed uteri which give no pain at all. Another symptom is metrorrhagia or too fre-

quent menses. This is observed in cases of large uteri, the subjects of endometritis. Dysmenorrhea and pressure on the bladder, pain at stool and from constipation, and nervous disturbances, are the principal complaints of the patient. The simple condition of retroflexion will not give all these symptoms; it is only when there is an enlarged uterus, with endometritis and lesions of the adnexa, that this symptom complex is obtained. In other words the complications, not the flexion, produce the symptoms. The author has been able to relieve many cases that have been treated without avail by all sorts of methods, by the use of vibration massage. Much of the pain and other disturbances are due to the formation of contracted cords in the vagina, which draw the organ out of place, and are the source of pain and tenderness. They are the result of chronic inflammatory processes in the parametrium. Pressure or tension on these cords is the cause of much suffering. The use of a pessary is impossible when it presses on these cords. They account for the vesical and rectal symptoms as well. Every movement of arms or abdominal muscles is felt in these tender cords. Metrorrhagia is caused in the same way. After the use of vibration massage the hemorrhage and leucorrhea are both lessened, and erosions of the cervix are healed. The nervous symptoms are referable to these cords. There is a very intimate plexus of nerves encircling the cervix and parametrium. The ganglion of the cervix uteri is a large mass of nervous tissue, all whose nerve twigs run to the genital organs. The entire vagina is inclosed in a thick plexus of nerve fibres. It is no wonder that disturbances of the parametrium bring about pain and nervous disturbances of a marked character. When we treat the organs with vibration massage all these disturbances vanish, even when the false position of the uterus remains. Hot douches and ichthyol tampons are of little value when there remains no acute inflammation but only the results of a past inflammatory condition. The author, after three years' use of vibration massage, believes that it is the only treatment that is applicable to such conditions, and results in leaving the patient free from all symptoms. The reason of this he is not prepared to state. There is an influence on the nerve fibres and ganglia, as well as on the mucous membranes. There are contraindications to massage. These are acute inflammatory processes, pregnancy and pus deposits. The massage is given with a Bihlmaier apparatus, with a hard rubber hammer, slowly vibrating, 1000 vibrations per minute with light pressure that gives the patient no pain. Results are evident in from two to three weeks. If the cords are very thick and hard, he uses a hot vaginal douche or intramuscular injection of fibrolysin. The hammer is applied to the uterus itself as it causes the relaxed organ to become firmer. The bad position of the uterus often disappears after use of vibration, the cords relaxing. When the uterus is

heavy he employs a pessary to keep it in place. The author cites ten cases treated by this method with the best results, and could cite many more. A condition that has for years been a bugbear has now become a pleasure to treat, on account of the good results obtained and the relief from suffering of the patients.

Clinical Symptoms and Operative Handling of Uterine Myomata.—Albert Sippel (*Münch. med. Woch.*, Nov. 21, 1905) says that, anatomically, uterine myoma is a benign growth. On the other hand we are learning that it frequently has complications that render its prognosis bad. In patients who are well off and can afford to wait and not undergo treatment until the menopause relieves them of many of their symptoms, the growth may be left *in situ*. In a working woman who must earn her own living, one must operate when the symptoms are such as to diminish her usefulness to her family. If the tumor appears soon after marriage, in a young woman, the need of interference may be much greater than in an elderly woman near the menopause. Operation gives a mortality of 25-30 per cent. after the operation. Thus we see that operation should be undertaken when there is direct danger to life from the presence of the growth. Small growths that produce few symptoms and no hemorrhage may be left *in situ*. If metrorrhagia endangers life, an operation must be performed. The patient may become so weakened by pain and loss of blood that a slight intercurrent trouble will be fatal. Some myomata have an almost specific effect on the heart. We cannot say whether it is the result of anemia or a sort of cachexia produced by the tumor. Death after operation arises from ileus or embolism, for the most part. The dangers of embolism are greatly lessened by not waiting too long before removing the growth, and by using ether instead of chloroform. It is useful to elevate the pelvis twice in each twenty-four hours to prevent the filling of the elastic pelvic veins and the occurrence of stasis and thrombosis. As to the nature of the operation to be performed, we should be conservative as to the removal of the adnexa. According to the position and size of the tumor must we decide upon the abdominal or the vaginal route for operation. According to the age of the patient will it be necessary or not to preserve ovulation and the possibility of childbirth. Out of 37 women who had had the myomata enucleated, 34 became pregnant, and they have borne 45 children among them.

Myomectomy.—Charles P. Noble (*N. Y. Med. Jour.*, May 19) has performed sixty-six myomectomies out of a total of 337 operations for fibroids. He limits the field of myomectomy to the removal of fibroid polyps and submucous fibroids by the vaginal route, and subperitoneal fibroids when single, or, at all events, limited to two or three tumors, occurring in childless women less than 40 years of age, by the abdominal route.

Myomectomy preserves the possibility of conception, but the probability of it is slight, therefore it is of little practical importance when deciding between hysterectomy and myomectomy. The mortality from this operation is greater than from hysterectomy and the convalescence is more protracted, due to hemorrhage or to peritonitis. In discussing the retention of the ovaries after hysterectomy for fibroids the writer has found no difference in the course of the cases when they were left in place.

Hysteromyomectomy.—Thomas S. Cullen (*Four. Amer. Med. Assn.*, March 10) advises the immediate examination of uterine mucosa and myomatous nodules after hysteromyomectomy to exclude malignant disease. This examination should be made before the cervical stump is closed. He cites the following case to illustrate the importance of this examination. Supravaginal hysterectomy supposedly for simple interstitial and subperitoneal myomata. Two years later sudden collapse, due to hemorrhage from a sarcoma developing from the cervical stump. Re-examination of the original tumors showed typical sarcomatous transformation of the myoma.

The Magnet as an Aid in Diagnosis and Treatment in Gynecology.—Hugo Sellheim (*Zent. f. Gyn.*, March 17) says that the movability of the uterus is an important diagnostic sign in uterine conditions. In case of tumors bimanual examination with change of position aids in the diagnosis, whether the tumor is within or without the uterus. The fundus of the uterus is that by which we judge the conditions present. The author devised a method of making the fundus uteri a temporary magnet by introducing into the canal a core of soft iron which is magnetized by the presence over the abdominal wall of an electromagnet. This procedure is easy and harmless. The core of soft iron is made similar to a sound and is introduced under aseptic precautions, so that there is no more danger in its introduction than in that of an ordinary sound. If the uterus is sufficiently open the soft iron core is introduced with ease: if it is contracted a dilator or a laminaria tent is first inserted. The sound is furnished with a shoulder which prevents it from being introduced more than the normal length of the uterine cavity. It is connected with the electric generator and the fundal end becomes a negative pole, while the vaginal end becomes a positive pole. The electromagnet is a positive pole. The two like poles attract each other, while the unlike repel one another. The fundus uteri follows the electromagnet, which is delicately balanced so that it can be easily moved about. It is brought as close as possible to the fundus uteri, and that is drawn towards it, so that the position of the uterus is changed as the magnet is moved. This is of the greatest use in replacing a retroflexed uterus, as the bimanual method of reposition can be combined with it. The uterus moves easily without any pain to the patient or violence to the organ. Adhesions are gradually

stretched. If the uterus is much retroflexed the magnet is pressed deep behind the fundus; if it lies horizontally the vaginal pole is brought nearer it. In general the magnet is brought near the abdomen without the current being turned on in the uterine core. The current is then turned on and the examining hands can feel the movements of the fundus as it follows the external magnet. This procedure is of great diagnostic assistance and the author hopes to make it a therapeutic measure of value also. The strength of the drawing power of the magnet can be regulated by the strength of the electric current and the duration of its use. It has a powerful psychic effect on the woman, for she can feel the movement of the uterus as drawn by the magnet and can be assured of its reposition in retroflexion. Whenever there are contraindications to the use of the sound or to bimanual examination the magnet is also contraindicated.

Inguinal Hernia of the Uterus.—Heinrich Hilgenreiner (*Berl. klin. Woch.*, March 12) details thirty-nine cases of inguinal hernia of the uterus which he has collected from literature, and describes one observed by himself. Hernia of the uterus in the inguinal region is found in persons of all ages, newborn children, women in middle life, and old women. In about half the cases the hernia is congenital and there are other defects of the genital system, such as malformations of the uterus, uterus bicornis, bipartus, or duplex, or rudimentary development of the uterus. There may be defects of the tubes, ovaries, or vagina, shortening of the uterine ligaments, pseudohermaphroditism and other forms of partially masculine organs. Absence or irregularities of menstruation are frequent. This condition occurs more often on the left side of the body. Birnbaum says that on account of the physiological torsion of the uterus the organ is nearer to the inguinal ring on the left than on the right side. In general the hernia contains the ovaries and tubes as well as the uterus and some part of the intestine. The uterus is usually not reducible. Pregnancy may complicate the diagnosis, but the condition is soon recognized. There is swelling of the sac at the time of menstruation. The treatment can only be operative, since the hysterocele is irreducible. In eight cases of pregnancy five were operated on by Cesarean section, one by induction of abortion, one by Porro operation, one by induction of abortion followed by total extirpation of uterus and adnexa. In nonpregnant cases some plastic operations have been done, the uterus being replaced as far as possible and made to fill the breach. Others have undergone amputation of the uterus. The author's case was not pregnant, there were no anomalies of development, and no congenital hernia existed. The patient came of a family with a decided taint of insanity, but up to the time of the hernia suffered no neuropathic symptoms. After the hernia occurred she was attacked by melancholia of a severe

type, which was cured entirely by the operation. The hernia contained uterus and adnexa and occasioned severe backache. It was irreducible. The operation consisted in freeing the intestine, replacing the genitals as far as possible, and using the uterus to fill the breach in a plastic operation.

Bier's Treatment in Chronic Endometritis.—Felix Turan (*Zent. f. Gyn.*, March 24) details his experiences with the Bier suction method in chronic endometritis. The catheter used for suction has long fenestræ, is somewhat conical, and is furnished with a shoulder which allows the cervix to be closed while suction is made. The use of the suction is quite painless, the patient feeling only a drawing sensation at the beginning. At the end of the aspiration the catheter is found full of mucus. He gives as examples of the effects four uncomplicated cases of endometritis, all of whom were sterile, and all of whom had had a marked leucorrhea for from three to twelve years and had general symptoms referable to the condition. The treatment was given on alternate days for twenty treatments. Each sitting continued from five to twenty minutes. After the first suction the discharge lessened, and at the end of treatment had almost ceased. All symptoms improved and the patients went away cured and continued for some months in that condition.

Adenocystoma Ovarii Sarcomatodes.—According to Frank E. Taylor (*Jour. Obst. and Gyn.*, April), the development of sarcomatous tissue in multilocular ovarian adenocystomata is a very rare condition, and in the cases reported has occurred from the thirty-third to the sixty-second year. This condition may be apparent on opening the abdomen or may exist in an apparently innocent cyst and be discovered only after a careful microscopic examination. The sarcomatous tissue may be present in the cyst wall in the form of plaque-like solid thickenings, as irregular nodosities, or as sessile or polypoid solid growths springing from the cyst wall. In sarcomatous cysts metastases are rare, and they are confined entirely to the peritoneum. Recurrence usually follows ovariectomy in these cases within a very short time. It grows with fearful rapidity and usually causes death within a few weeks. The writer reports two cases where the diagnosis was made only by microscopic examination. One case died from recurrence in twenty-seven days from the time of the original operation.

Heteroplastic Ovarian Grafting.—Robert T. Morris (*Med. Rec.*, May 5) reports the case of a woman 21 years old, from whom he removed both ovaries completely, for cirrhotic ovaritis. Just prior to this operation he removed a wedge-shaped ribbon of normal ovarian tissue from a patient being operated upon by H. J. Boldt for uterine prolapse. The above-mentioned ovarian tissue was placed in saline solution at a temperature of 100° F. and kept at this temperature until the above-cited ovariectomy was performed. Then a slit was made through

the peritoneum of the broad ligament on either side, parallel with the oviduct. In each slit was placed a segment of the ovarian tissue removed from Boldt's patient. These grafts were held in place by a single suture. The patient made an uneventful recovery and four months later menstruated for the first time in over two years. Four years later she was delivered of a normal child. The writer took great care in removing the cirrhotic ovaries, and used Tuffier's angiotribe so as to be sure not to leave any ovarian tissue behind. He believes this to be a well-defined case of heteroplastic ovarian grafting followed by menstruation and pregnancy.

Orthopedics of the Abdomen.—Guglielmo Bracco (*Münch. med. Woch.*, Feb. 12, 1906) advocates the use of an abdominal bandage designed by himself on the principle of the spiral, making use of modeling to fit the figure of the patient. The crude form of the bandage is made by passing an elastic bandage in the form of a double figure-of-eight about the pelvis and the two thighs of the patient. This bandage is modified so as to open down the middle of the front of the abdomen and down the outer side of each thigh, so as to be easily put on and taken off by the patient. The movements of the patient must be entirely unrestricted by the bandage, which is elastic and comfortable. It may be used for displacement of the kidneys, relaxation of the abdominal muscles, umbilical hernia and all other troubles that demand support for the abdominal muscles. Its effect is noticed very soon after wearing it. This, at first, is purely mechanical, but very soon the abdominal muscles begin to be better nourished and the circulation in the skin improves. After six or seven months of wearing the bandage the shape of the abdomen changes, the muscles strengthen and become well nourished, and in pure relaxation a cure is obtained. Severe cases, with marked nervous conditions and symptoms of oöphoritis and appendicitis, are much benefited, the nervous symptoms disappearing. It becomes possible to go without any bandage in some cases. When worn through the last months of pregnancy and the first following labor, it prevents weakening of the abdominal wall and preserves the woman's normal figure. It relieves albuminuria due to prolapsed kidneys, the obstipation and the painful menstruation that accompany many cases of prolapsed abdominal walls. It is of equal value for postoperative hernia.

Bacteriology of Peritonitis in Relation to Pelvic Surgery.—Percy W. G. Sargent (*Four. Obst. and Gyn. Brit. Emp.*, Mar.) finds the most important and frequent organisms concerned in peritonitis are the staphylococcus albus and the colon bacillus. After these may be placed the streptococcus pyogenes, bacillus pyocyaneus, pneumococcus, gonococcus and rarely the staphylococcus aureus. The staphylococcus albus appears to have a beneficial influence by causing an exudate containing vast

numbers of phagocytic cells, and it is upon the presence of these cells that the chances of recovery depend. Out of 258 cases of peritoneal lesions this coccus was found 108 times, while in 17 a similar coccus was found but not definitely identified. The colon bacillus, or one of its varieties, is one of the commonest causes of peritonitis and may exhibit a degree of virulence second only to that of the streptococcus pyogenes. Apart from puerperal peritonitis the streptococcus pyogenes is rarely found, and when present gives rise to a very rapidly fatal form of peritonitis.

Peritonitis following extrauterine gestation showed a staphylococcus albus, of a low degree of pathogenicity, in 17 cases examined. In five out of eight cases of salpingitis the interior of the tube and the peritoneal exudate were found sterile; but in one case gonococci were found. It must be recognized that the gonococcus is an actual and probably common cause of peritonitis, and when the cause of infection is removed the prognosis is exceedingly favorable. In the operative treatment of peritonitis the surgeon must see that he does not interfere with the natural mode of resistance, but must deal with the source of infection, by removing dead material, and where necessary, providing for drainage. Strictly local lavage with sterilized saline solution, and gentle dry mopping of the part chiefly affected are the only measures of cleansing which should be attempted. Blood should be removed from the peritoneal cavity promptly by irrigation. In mild infections, where much foreign material is present, it should be removed by copious and general irrigation, but in more virulent infections the cleansing should be strictly localized. It may be laid down as a general rule that bacteriology and practical experience teach that drainage is unnecessary in peritonitis connected with intraperitoneal hemorrhage and pyosalpinx; but in more severe infections, such as those arising from a suppurating or gangrenous ovarian cyst, some form of drainage is necessary. Localized collections are, for practical purposes, extraperitoneal, and require the same treatment as abscesses in other parts. The writer condemns the use of opium as it may aid intestinal paralysis and tends to inhibit leucocytosis. He finds purges, contrary to the general belief, to be beneficial. In speaking of the serum treatment he finds the results are at least sufficiently suggestive to warrant an extensive trial.

DISEASES OF CHILDREN.

Hours of Sleep for Children.—E. Perier (*Ann. de Méd. et Chir. infant.*, March) states that lack of sufficient sleep in children causes considerable damage; they lose the faculty of fixing the attention, are easily fatigued, and the brain is so affected that it may never recover from the strain, and the result may be per-

manent disability. Such children leave school much worse equipped for the struggle of life than if they had studied less and slept more. Mental development has been at the expense of the physical. Repose has the object of repairing the forces, muscular as well as mental. It is one of the means to put off the approach of physical and mental old age and prevent a too rapid destruction of the vital forces. It is the true policy of wisdom to regulate and retard the consummation of life. Sleep obliges the organism to stop and accumulate new strength for the morrow. Lack of sleep uses up all the reserve force of the body. The number of hours needed may be stated thus: nine hours in summer and nine and a half in winter for all children. Nature shows us by the example of the young infant that we must sleep. The babe nurses, which represents the work of the adult. Then he sleeps some hours and is again ready for work. We may take a lesson of wisdom from his example.

The Diathetic Child.—Legrand Kerr (*Arch. of Ped.*, April) says that the child is a much less settled being in the early days of its existence than is popularly supposed. The importance of heredity is greatly overestimated, while environment is really a far more potent factor in the production of delicate children. Heredity is the principle by virtue of which the offspring tends to resemble its ancestors. One of the great sources of error is made in considering the history of disease in the parents, but leaving out of all consideration that of the grandparents and great-grandparents. A diathesis is a congenital, not necessarily hereditary, condition of the system which renders it particularly liable to certain diseases. The diatheses are, particularly, the tuberculous, the uric acid, the hemorrhagic, and the obese. The writer does not recognize a scrofulous diathesis, and does not consider the term as synonymous with tuberculous. With appropriate treatment a scrofulous tendency is rapidly and easily eradicated. In the presence of the tuberculous diathesis it requires but slight exposure to start the disease, either through the digestive or the respiratory tract. The chief object in the recognition of the uric acid diathesis is the prevention of cardiovascular changes. In the hemorrhagic diathesis the factor of heredity is the point to be emphasized. Obesity is of two kinds: one may be termed mere fatness; the other is diathetic and depends upon imperfect oxidation.

Acute Disease of the Bones in Children.—George Rose (*Scot. Med. and Surg. Jour.*, April) claims that in the long bones of children acute diaphysitis is the primary disease, and that acute septic arthritis, acute periostitis, acute osteomyelitis, acute epiphysitis, and acute necrosis are but results and manifestations of the original pathological condition, and that these different manifestations are due partly to causes not yet understood, but partly to evident enough causes, such as the virulence and site of the attacking microorganism, the varying amount of ossi-

fication of both epiphysis and diaphysis, and to the relation of the epiphyseal cartilage to the capsule of the joint. He says that when, at the end of any of the long bones in a child, we find great pain and tenderness on pressure, associated with severe constitutional symptoms, it is our duty, even before there is visible swelling, to regard it as a case of acute septic diaphysitis, and to operate immediately.

Atrophy and Adduction Deformity of Hip Disease.—Atrophy of tubercular hip disease, says Wallace Blanchard (*Chic. Med. Rec.*, April 15) is often confounded with simple shrinkage. Shrinkage is temporary; atrophy is permanent. Atrophy follows about in proportion to the extent of the tubercular destruction in and about the hip joint. Four years or less of mechanical treatment produces temporary shrinkage, but never causes permanent atrophy. Four years or less of mechanical treatment never produces shortening. If mechanical treatment lessens the tubercular destruction in and about the hip joint, to that extent it prevents both atrophy and real shortening. Mechanical treatment that abducts the leg usually prevents adduction deformity. The adduction deformity of recently recovered cases should be corrected by stretching the adductors. Intra-articular redressment offers the best results, and at the same time it is a very safe method for correcting adduction deformity of ankylosed cases. A judicious combination of moderate outdoor exercise, with efficient mechanical protection of the diseased joint, promotes reparative processes and tends to prevent deformity.

Epiphyseal Separation of the Great Trochanter.—The patient, a girl of 11 years, whose case is recorded by C. O. Thienhaus (*Ann. Surg.*, May) received the injury by falling heavily upon the hip. She was able to limp home, a distance of about a mile, though there was considerable pain in the region of the trochanter. The following morning she was unable to arise, as every attempt to step on the left foot caused great pain from the left great trochanter down to the knee. When seen four weeks after the accident she could move her leg in all directions without discomfort, while lying in bed. Pressure in the region of the great trochanter caused considerable pain. The hip-joint functions were normal. Attempts to stand caused the same pain as the day after the fall. When standing the thigh was rotated inward and slightly flexed. A radiograph showed that there was incomplete separation of the epiphysis of the great trochanter, a small portion of the bone having apparently been torn off from its lower portion. Complete recovery followed absolute rest in bed for six weeks with a well-padded plaster bandage exerting slight pressure over the great trochanter. Epiphyseal separation of the great trochanter usually occurs between the ages of 7 and 17. It may be complete, often with fatal results, or incomplete, the periosteum and tendons

portions not being torn. The cause appears to be direct violence. The reason for the frequent fatality of complete separation of this epiphysis is given by Hamilton as the peculiar tendency to the formation of pus and occurrence of pyemia, possibly on account of the great vascularity of the bone at this point, a lesion of the spongy portion leading to absorption of septic material. The differential diagnosis from contusion of the trochanter is almost impossible, on account of the insignificance of local symptoms. When pain or pressure over the trochanter and inability to walk on account of pain from this region to the knee, which the attempt causes, is found in a young person who has had a severe blow or fall on the great trochanter, while active and passive motions in all directions at the hip joint are possible, the presence of a separated great trochanter is so probable as to demand immediate X-ray examination. Even with complete separation this may be the only sure means of diagnosis, as the swelling may prevent palpation of the detached trochanter. The treatment of incomplete separation is rest in bed for six to eight weeks with a plaster cast enclosing the entire leg and pelvis. For the complete separation the writer advises immediate suturing of the detached trochanter in place. If inflammation and suppuration set in, the trochanter should be removed at once and the parts incised freely to establish drainage.

Certified Milk of Philadelphia.—The requirements of the milk commission of the Pediatric Society of Philadelphia are that certified milk shall be free from dirt, pus and injurious organisms, and shall not contain more than 10,000 germs per cubic centimeter; that it shall range from 1.029 to 1.034 specific gravity, be neutral or faintly acid, contain not less than 3.5 to 4.5 per cent. proteid, from 4 to 5 per cent. sugar, and not less than 3.5 to 4.5 per cent. fat, no preservatives or foreign coloring matter, and shall not be heated. A. H. Stewart (*Am. Jour. Med. Sci.*, April) finds, by regular examination of the milk of the six dairies supplying certified milk during the year, that from 16 to 81 per cent. of the samples of these dairies were below the standard. The equipment of the dairies seems to be in advance of the training of the employees. The analyses impressed the importance of examination for pus and streptococci. The milk should be delivered the same day that it is received by the dealer; usually it is stored for twenty-four hours. The standard of 10,000 bacteria is too high to attain with the present equipment of the railroads; refrigerator cars are necessary. Covered milk buckets should be required to be used in all dairies. The public should be educated to appreciate that their demand that milk shall be delivered early in the morning leads to its storage for twenty-four hours.

Results of Feeding with Malted Gruels.—E. Terrien (*Rev. Mens. d. Mal. de l'Enf.*, March) has experimented in feeding children on malted gruels when they were unable to take milk

and gives us his conclusions. The gruel was made with two-thirds liter of water, one-third liter of milk, 70 grams of cream of rice and 50 grams of sugar. The quantity of milk and of sugar was varied in different experiments. He fed a large number of children in this way. The advantages of this method of feeding are evident; in twenty-four to thirty-six hours the stools take on a normal appearance, and the weight increases. There is a considerable alimentary value in such a gruel; there is some butter and casein, and these serve for a time to nourish the infant, even for several weeks, until the intestines recover their normal condition. The best results were obtained when saccharification was passed and the starch was all converted, so that the bouillon was perfectly liquefied. The indications for the use of malted gruels are exact. They are to be used when the infant tolerates milk badly, in dyspepsias, in chronic gastroenteritis, and in convalescence from acute diseases. They should never be used in the acute stage, for in febrile conditions they are badly borne. They are contraindicated in all acute infections with tendency to vomit, and they should not be given to very young infants. We should avoid a too sudden return to milk diet, and should at first add a small amount of milk to the gruel.

Acholia.—White stools without jaundice occur, says F. J. Poynton (*Clin. Jour.*, March 28) in pancreatic disease, the pale color being due to the solidification of the fat when the movement cools, although there may be a normal amount of bile present. When these stools are freed of their fat with ether the normal color appears. Similar stools are present in the condition known as acholia. The onset of this illness is usually abrupt. The child is usually under five and generally under two years of age. The characteristic symptom is a complete change in the character of the stools, which become colorless, greasy and offensive. They are often more bulky than natural and sometimes more frequent. The general health quickly suffers. At first there may be slight fever, but generally this soon passes and is replaced by a subnormal temperature. The child rapidly loses firmness, wastes and becomes feeble, languid and irritable. The food is badly digested and ferments, so that the abdomen becomes distended. Such a condition is with difficulty distinguished from tuberculosis of the alimentary canal and peritoneum. Concerning the etiology, considerable importance has been ascribed to painful dentition, which is supposed to act reflexly. Sudden chilling may be an important factor. Whether the condition is entirely biliary, entirely hepatic, or both biliary and hepatic in origin is uncertain. In favor of the hepatic origin the writer describes a case in which the condition was preceded by jaundice. The prognosis is good. The treatment includes great restriction of fats, giving starches only in small quantities; diet of broths, beef tea, fish, meat food,

skim milk, malted biscuit, fresh fruit and baked apples. In bad cases asses' milk is valuable. Brandy is useful in small doses in severe cases, with bismuth and opium for diarrhea. Small doses of the chlorides of arsenic, iron and mercury are given. The gums should be lanced if necessary. Chloral and bromide may be needed for great nervous irritation. The extremities should be kept warm, aided by rest in bed.

Prevention of Summer Diarrhea.—J. T. C. Nash (*Practitioner*, May) shows, from the London diarrhea curve, that the mortality from this cause corresponds very closely with the multiplication and decrease in numbers of the common house-fly. This appears in appreciable numbers in June, increases rapidly through July and August and thereafter decreases, until it becomes rare with the onset of cold weather. The fly's well-known impartiality in its choice of food or excreta and other filth of organic nature is emphasized. The writer believes that the house-fly is the essential cause of epidemic diarrhea, carrying bacteria to food, the germs of which are the active cause of diarrhea. The prevention of summer diarrhea, therefore, in the writer's opinion, demands chiefly such sanitary reforms as will prevent the accumulation of organic refuse of any kind in which the fly may deposit its eggs and on which it may feed and gather bacteria. Destruction of house flies, covering of milk and other articles of infants' food, and inculcation of habits of cleanliness in the preparation of food and choice and care of nursing bottles, etc., are other points of importance.

Vaginal Drainage in Children and Young Adults.—A. W. W. Lea (*Med. Chron.*, May) calls attention to the fact that although this form of drainage is so often employed in adults it is rarely used in children. Kelly, for example, in illustrating a case of abscess bulging into the pouch of Douglas in a girl ten years of age, says, "Vaginal drainage impossible, owing to age of patient." For some years the writer has employed vaginal drainage in children whenever it has been necessary to drain the pouch of Douglas, and the results have been satisfactory in every case. In some cases abdomino-vaginal drainage was used, in others vaginal alone. His cases number twelve, the ages being 5 to 14 years, the affections being acute appendicitis and tuberculous peritonitis. The writer believes that vaginal drainage should be employed in all cases of acute diffuse peritonitis in children, for localized pelvic abscess if it can be felt bulging in the pelvic floor, and may be of value in tuberculous peritonitis. The vagina of even a young child can be readily dilated to admit the finger, often without any abrasion or laceration of the parts. A small retractor is now introduced. The vagina should be thoroughly disinfected and the cervix seized with a fine volsella. A snip is made in the mucous membrane of the posterior cul-de-sac with scissors and a pair of forceps pushed into the peritoneal cavity. If abdominal drainage is also to

be established, the tube may be drawn through from above. A piece of silk should be attached to the vaginal tube to permit of its withdrawal when necessary. The presence of the tube in the vagina causes no discomfort, and it is very well borne by even young children.

Causes and Pathogenesis of Severe Hemorrhages in the New-born.—P. Lequeux (*L'Obstétrique*, March) describes the cause of severe hemorrhages in the new-born as some form of infection and its effects on the blood of the infant. The syndrome hemorrhage in the infant appears during the first fifteen days of its life, and is a result of a general condition characterized by symptoms of which hemorrhage is the most important. It is much more common than is generally supposed. The hemorrhages are often manifested only internally and escape notice. Out of 2,162 deliveries at the Saint-Antoine Maternity in Paris, from May, 1904, to May, 1905, there were 44 cases of hemorrhage, of which only 25 had external hemorrhages. The hemorrhages were multiple internal and external, 10; umbilical, 3; gastrointestinal, 4; cutaneous and mucous, 6; visceral, 18; cerebral, 2. The development of the child seems of value etiologically. Of the author's cases, 39 per cent. were below the normal size and weight, 25 were above it. The feebleness of the child and the state of active formation going on in the organs aid the infection in entering the system. The predisposing causes may be divided etiologically into two groups: the first includes hereditary conditions, the second, acquired troubles. Among the hereditary conditions are hemophilia, syphilis, albuminuria, eclampsia and Bright's disease in the mother, alcoholism and lead poisoning. These conditions merely prepare the ground for the infection. All bacteria may cause hemorrhage when they infect the system. The most frequently found are streptococcus, pneumobacillus and staphylococcus. Colon bacillus is frequently associated with the others. The infection may be ante-partum and transmitted to the child from the mother by the placental blood or by way of the vagina in premature rupture of the membranes. It may be contemporary with the delivery. Septicemia is the most important factor in the production of the hemorrhagic condition. The liver and spleen are most affected. There is an infiltration of the liver with leukocytes and an alteration of the cells of the nature of degeneration. The spleen takes on congestion and hyperactivity of macrophagic nature. There is an infiltration of all the organs with ferric pigment. There is often icterus. The blood is much altered. There is a polycythemia, and normoblasts appear irregularly; there is leukocytosis, at first polynuclear, later mononuclear. The serum undergoes hemolysis and the pigment appears in the circulation. The clot is less easily formed, and loses its retractility. Under the influence of a toxi-infection the organism unites all the conditions necessary for hemorrhage: 1. Alteration of the

vessel wall by hyperplasia, diapedesis and sclerosis. 2. Alteration of the blood; the quantity of blood circulating is increased by polycythemia. The elements are altered by leukocytosis and agglutination. The serum undergoes hemolysis by the action of the cellular sensibility and that of microbes. The quality of the plasma is changed by incoagulability and leukolysis. 3. Alteration of vasomotor conditions causes passive dilatation due to hepatic toxins. These act on the heat centers. The alterations of spleen and liver are responsible for all the symptoms and changes that occur.

Etiology of Tuberculosis in Infancy.—Arthur Schlossmann (*Archiv f. Kinderheil.*, Bd. 43, 1-4) argues for the origin of tuberculosis in infancy as not aërogenous, but enterogenous, the entire digestive tube from the mouth to the anus taking part in its origin. He believes that we must consider the hereditary origin of tuberculosis as of more importance than we formerly did, since it has been demonstrated that the placenta, like any other organ, may be affected by tuberculosis. This lesion may be found in mothers who have a simple catarrh of the apex, as well as in advanced pulmonary tuberculosis. There have been found bacilli in the maternal placenta in portions in which the circulation was still maintained, as well as free in the fetal portion of the placenta. We must admit that more often than we had supposed there is a direct infection from mother to fetus by way of the placenta. Why we do not have this mode of communication more often is a question to be considered. There seems to be no resistance of the organism to the bacilli, as there has not been found any attempt to cause encystment of the bacilli on the part of the organism. In the second year of life there is an attempt at encystment. There is possibly a condition of latency of the infection which has reached the fetus. Any individual that has tubercular foci reacts promptly to tuberculin, and this is true of infants as well as adults. The author has never in the first days or weeks of intrauterine life obtained a reaction to tuberculin. Hence we cannot have a true infection, but we may have one that is latent. If a child be separated from its tuberculous mother immediately after its birth and no tuberculin reaction is obtainable for three, six or nine months, and then a reaction is obtained, we may suspect a new source of infection in the new surroundings of the infant. The author believes that the true source of infection is not in the diet of the child, the milk used, but in the presence of infected persons in its vicinity. Nevertheless, the infection does not come by way of the air passages, by inhalation, but by way of the digestive canal. The bacilli reaching the intestines may be carried into the circulation or the lymphatic system as easily as the fat drops from the digested food. By this method they may enter the lungs or pass into the bronchial glands. The bacilli have never been found in the air-cells of the infant. The author's assistants have examined hundreds of specimens

without finding a single case of primary tuberculosis of the larynx in an infant, or of the large bronchi, or the bifurcation of the first bronchus. Such would not be the case were the entry of the germs by way of the air passages. They do not appear in the lungs by way of the trachea in the alveoli, but by way of the lymphatics and blood in the capillaries of the lungs. The mouth, and especially the tonsils, may be the port of entry as easily as the intestine. The nasal mucous membrane also may be at fault. Hence the author believes that the usual way of entry during the first year of life is by the digestive canal.

Frequency of Tuberculosis in the First Year of Life.—Eugen Binswanger (*Arch. f. Kinderheil.*, Bd. 43, 1-4) gives us the result of the treatment of tuberculous children in the Dresden Infants' Hospital from January, 1900, to October, 1905, during the first year of life. There are records of autopsies on 532 children under one year. Of these, 36 were found to have had tuberculosis—that is, 6.8 per cent. In the first quarter of the first year there were 2.2 per cent. of tuberculosis; the second quarter gives 8.4 per cent.; the third and fourth give 16.8 per cent. Thus the liability to tuberculosis increases with the age of the child.

Aortic Disease in Congenital Syphilis.—C. Bruhns (*Berl. klin. Woch.*, Feb. 19 and 26) has made a systematic examination of the entire aorta in nine children who died at birth, and who showed strong evidences of congenital syphilitic infection. He also examined the aorta of a normal child who died at birth. In six of the nine children he found evidences of syphilis of the aorta. There was cell infiltration of the adventitia; the media was also infiltrated, and in one case there was a large mass of cells that might be denominated a gumma. There were small mononuclear cells, polynuclear cells, leucocytes, and epithelioid cells, as well as proliferated connective tissue cells. The author concludes thus: 1. In congenital syphilis there are found masses of inflammatory tissue in the aorta in both media and adventitia, as well as in the neighborhood of the vasa vasorum. 2. The appearances are similar to those described by Chiari as productive mesaortitis. 3. The observations go to show that Chiari's mesaortitis productiva is a form of congenital syphilis in the aorta.

Exception to Colles' Law.—A case is recorded by W. A. James (*Inter. Med. Jour.*, Feb. 20) as being an exception to Colles' law that a mother nursing her own child, that child being a congenital syphilitic, cannot be infected by it, even though the child's mouth is ulcerated. The woman is said to have been bitten by her baby, the wound in the areola of the breast healing in five days. Seventeen days after the bite a blister appeared at the same point, broke, and became painful and ulcerated. The ulcer was irregular, tender, indurated, and painful, with scanty, yellowish discharge. One axillary node became enlarged and

tender. It was followed by a typical macular eruption, mucous patches, falling out of hair, bone pains and general enlargement of lymph nodes. Improvement rapidly followed the use of mercury. The baby was wasted, with enlarged spleen and liver, excoriations about the anus, irregular teeth, and hoarseness. The writer could find no other possible source of syphilitic infection of the wound of the breast.

Diagnostic Value of Leukocyte Formula in Pertussis.—F. S. Churchill (*four. Amer. Med. Assn.*, May 19) has studied the differential leukocyte count in 100 cases of pertussis in patients ranging in age from 6 months to 17 years, 64 of these being collected from the literature, and the total leukocyte count in a larger number. He finds that a general leukocytosis is present in almost all cases of whooping-cough. A lymphocytosis is found in about 85 per cent. of cases at some time during the course of the disease. It is found even more constantly during the early or catarrhal stage, over 90 per cent. showing the phenomenon at this time. A lymphocytosis is not usually found in those conditions difficult to distinguish from whooping-cough. Therefore, the presence of a lymphocytosis in a child with a hard, persistent cough is a factor of great diagnostic value. It is also of prophylactic importance inasmuch as it can be utilized to prevent the spread of the disease by leading to the prompt isolation of the patient. The child's age must be taken into account in estimating the importance of the lymphocyte percentage.

Cerebrospinal Meningitis.—G. C. Robinson (*Amer. Jour. Med. Sci.*, April) says that in a study of fifteen cases of epidemic cerebrospinal meningitis the organism isolated from the spinal fluid, circulating blood, pus from the conjunctiva, and from the central nervous system at autopsy, agreed in all respect with the *diplococcus intracellularis meningitidis* of Weichselbaum. It was isolated in pure culture from the spinal fluid of the fourteen cases in which lumbar puncture was performed, and is to be considered the causal agent in all the cases. This organism was obtained from the circulating blood of two of the four investigated cases, but in one only did it grow on the various culture media. The organism is probably only an occasional invader of the circulating blood. It may be present in the blood for many days during the course of the disease, and does not occur only as an agonal invader of the blood. The *diplococcus intracellularis meningitidis* may occur in the pus of purulent conjunctivitis, a complication not infrequently seen in meningitis. It was isolated from one of the two cases which showed this complication in the writer's series. Secondary lung infections with pyogenic organisms are frequent, and a terminal bronchopneumonia was found in five of the six cases that came to autopsy, all of which showed the presence of pyogenic cocci.

Pneumonia with Cerebral Symptoms.—Josephine Hemenway (*Arch. of Ped.*, April) records a case of pneumonia with marked

cerebral symptoms in a child of two years, in which the fluid obtained by lumbar puncture showed the presence of the pneumococcus. In only one other case, says L. E. Holt, have the pneumococci been demonstrated at the Babies' Hospital in the fluid drawn by lumbar puncture. In this case the nervous symptoms disappeared so promptly and completely with the fall in temperature that it is doubtful if any exudation was present in the brain.

Diagnosis of Pneumonia and Empyema in Children.—Alfred Hand, Jr. (*Penn. Med. Jour.*, April) says that if a child with fever is breathing more than forty times a minute while lying undisturbed and not temporarily excited, the burden of proof is on those who would say that pneumonia is not present. The frequency of respiration may be kept down by an overlying pleurisy, in which case there will be movement of the nostrils and usually an audible grunt between inspiration and expiration. Auscultation gives the greatest information about pneumonia, for bronchial breathing and increased voice sounds may be very distinct while the area of consolidation is so small that dullness and increased fremitus cannot be detected. In cases without physical signs in which the continued high fever and rapid respiration convince one that pneumonia is present, it is necessary to exclude uncomplicated typhoid fever by the presence of leukocytosis, and meningitis by negative examination of the cerebrospinal fluid. Having established the diagnosis of pneumonia, at least a daily examination should be made for the development of empyema, for the mortality of this complication is considerably above that of pneumonia. Important points in its detection are the sense of resistance to the finger on percussion, absence of breath-sounds or distant character of the bronchial breathing over the effusion, presence of loud bronchial breathing and voice over the upper part of the lung, and in left-sided effusions, the presence of the heart-sounds more than a quarter of an inch to the right of the sternum. The temperature chart in empyema may be practically disregarded. While there is usually a slight fever, there may be a chest full of pus with a normal temperature.

Eye Lesions Due to Vaccination.—L. Alexander (*Munch. Med. Woch.*, March 13) refers to various authors who have noted cases of vaccine pustules having formed on the lids or eye structures, and describes a case in which a child of one year had an eruption of vaccine pustules over the entire face on the tenth and eleventh days after vaccination; also on the scalp, right hand and left knee. There was a pustule on each lower lid and marked edema of all the lids so that the eyes could not be opened. There were pustules on the edges of the lids, partly on the skin and partly on the conjunctiva, but the corneæ were intact. The author believes that the infant scratched the pustule of the

arm and then carried the vaccine to the other affected portions on the finger nails. Vaccine blepharitis is the form of lesion of the eyes that is most frequently mentioned in the literature of the subject. An unvaccinated child having eczema may become inoculated from a vaccinated brother, as is recorded in some cases, and we should not vaccinate a child with any skin disease in which the skin is broken in spots. One case of an inoculation of the eye accidentally with a vaccine lancet is recorded. Here the pustule left a permanent leukoma. But in most cases there is no leukomatous tissue left behind, and no trace of the pustule remains. Another more serious form of lesion is the keratitis profunda postvaccinosa, of which five cases are recorded. This leaves scar tissue, and the iris may become involved. It is due to the bad condition of health of the child, not to the vaccination. There is little to be said of the treatment except that prevention is of value.

Mastoid Abscess.—L. P. Gamgee (*Lancet*, May 5) has operated upon 61 cases of mastoid abscess in children under 15 years of age. Ten of these were of a form occurring in children not over seven years old, with no history of otorrhea, and in whom the membrana tympani appeared to be normal. In these cases the abscess is of slow and painless formation, the patient's temperature not being raised and the ear not being displaced. The abscess is due to primary caries of the mastoid, the patch of caries occurring somewhere along the line of the mastosquamosal suture, this being in a young child the softest and most vascular portion of the bone. If the patch of caries forms in the upper part of the mastosquamosal line and if perforation of the bone occurs, the dura mater of the middle cranial fossa is exposed and the mastoid antrum is not opened up. If the patch of caries occurs in the middle or lower part of the mastosquamosal line the antrum is quickly opened up and then the caries spreads rapidly through the mastoid.

Rheumatism in Children.—Montgomery H. Sicard (*Med. Rec.*, May 5) recapitulates the facts regarding the manifestations of rheumatism in children which are of importance and too often overlooked. Rheumatism in nursing infants is very rare. In childhood the disease is atypical, the joint signs being but little marked; the so-called complications being in children rather types of the disease, for they may occur without joint symptoms, either alone or associated with each other. The whole attack, while seemingly mild and subacute, is capable of causing severe damage to other structures, notably the endocardium, pericardium, and the nervous system. Relapses occur and patients are often left invalids for life.

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ORIGINAL COMMUNICATIONS.

THE PROCESSES OF REPRODUCTION.*

BY

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AMONG the many difficult problems that confront those who are devoting their life work to the study of the male and female generative organs, by no means the least interesting is the solution of the problem of the failure of reproduction in many instances where conditions are to all intents and purposes normal. The explanation of many cases of sterility is apparent from the various mechanical and pathological conditions so often found, nevertheless there are only too many cases in which there is no microscopic or macroscopic evidence of disease to explain the condition. When we take into consideration that fertilization often occurs under most unsuitable conditions; how the spermatozoon has succeeded in reaching the ovum when a supposedly imperforate hymen has blocked its way, we must be led to conclude that the solution of the problem of sterility often lies not in supposed obstruction due to mechanical or inflammatory difficulties, but to some abnormal

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interruption in the many unknown cyclic phenomena, chemical or physical, which may occur from the time of the growth of the spermatozoon and ovum to the period of fertilization and so on to the final implantation of the impregnated ovum into the uterine wall.

In order to comprehend the more clearly the possibilities of error in the normal processes of reproduction and to appreciate the delicacy of its adjustment, it is the purpose of the writer to call attention to some of the most recent conclusions of physiologists and biologists regarding (1) the origin and development of the spermatazoon, (2) the origin and development of the ovum, (3) the process of fecundation, (4) the determination of heredity, (5) the determination of sex, (6) the probable facts leading to the implantation of the impregnated ovum into the decidua of the uterine cavity, with the present theories of menstruation and its relation to ovulation.

Much of the work that has been done has been confined to plant life, insect life, and various species of the animal kingdom. Of necessity comparatively little knowledge has been obtained from observation on the human species. However, the similarity of the various processes of fecundation in sexual life generally is so great that we can, with a degree of reasonable certainty, assume that cause and effect are very much the same in human life.

It is a humiliating sense of the fitness of things that nature in her relation to each one of us regards all alike, the rich and the poor, the wise man and the fool, simply for one great purpose—reproduction. The prime object of material beings is the propagation of the species and the care thereof, after which follow degeneration and death. There is no better example of this than in the male of the bee family, who, in his wild flight, urged on by nature, soaring high into the air, madly impregnates his queen, only to end his life, having fulfilled his function, a broken and disemboweled mass. The life of the whole being is the life of its individual cell. And yet, carefully secreted in each mass of living protoplasm called a sexual being are cells guarded by the reproductive organs, which differ from their confrères in that they do not die, but continue to live, to grow, and eventually to become other beings. To the spermatazoon in the male and the ovum in the female is delegated this duty of procreation. Each is the counterpart of the other,

and by their union a being results, asexual in lower life maybe, sexual in the higher species, and inheriting the characteristics of its progenitors in all classes of existence.

First to consider the male fertilizing cell, the spermatozoon. Hidden away in the seminiferous tubules of the testis we find two sets of cells: (1) the sustentacular cells of Sertoli which are nutritional, furnishing the food for (2) the spermatogonia cells from which develop the spermatozoa. Each primary spermatocyte or spermatogonial cell produces two secondary spermatocytes and these in turn create four cells called spermatids, each one of which finally becomes a spermatozoon, functionally active and capable of fertilizing an ovum. The spermatozoa are arranged side by side, motionless, alike in most species, but in some, as in bees, of unequal size. Where the size is unequal, often the small spermatozoon finally disintegrates and only the large one becomes functionally active. Each spermatozoon consists of a head, middle piece and a tail. The head appears to be the essential part in the process of fertilization, and it is the counterpart of the nucleus of the ovum, and by its union with the nucleus of the ovum forms the embryo. This process of cell division with the eventual creation of the spermatozoa differs from ordinary cell division in one essential. In the nucleus of all cells of all animals are found certain bodies which react to the chromatin stain and are called chromosomes. The number of these bodies in the nucleus varies with the species, but is constant in every cell of each species. For instance, the cell of the human being contains sixteen. Now, in these generative cells, both spermatozoon and ovum, it is noted that the nucleus contains but one-half of the chromosomes of the original cell of its species. Thus by the union of the nuclei of the spermatozoon and ovum the impregnated cell contains the normal number of chromosomes, the new cell in this way acquiring equally the hereditary characteristics of both parents. The chromosomes, therefore, must play an important part in the function of the cell, transmitting, probably, hereditary characteristics, but not acquired, and possibly determining the sex of the individual. Uniting the head of the spermatozoon to its tail is the middle piece, whose supposed function is to transmit the male centrosome to the impregnated ovum. The centrosome is the instrument by which cell division is brought about. The tail is for purposes of locomotion simply.

It is motionless in the testicle, due to the density of the surrounding substance. In contact with the secretion from the epididymis it begins to show some slight evidence of motion. Beginning at the testicle these little bodies are carried along the vas deferens by the vermicular action, bathed in the secretion of the vas deferens until they are eventually discharged through the ejaculatory ducts into the secretions of the seminal vesicles, prostatic gland, and Cowper's glands, thus forming with these secretions the seminal fluid. The mechanical activity of the spermatozoon is only really acquired when it comes into contact with the secretions of the seminal vesicles. If they remain motionless in the fluid they are functionally dead. In the spermatic fluid the spermatozoa reach the height of activity. Experimentation has shown that they thrive most successfully in a warm alkaline viscid fluid, such as the seminal fluid, and that water, acid solutions and cold inhibit their vitality. The respective functions of the secretions of the seminal vesicles, prostatic gland, and Cowper's gland have been carefully worked out. The seminal vesicles are no longer regarded as the store-houses of the spermatozoa, but their function is simply to produce a fluid of a viscid, alkaline nature, which, in addition, probably furnishes some nourishment to the spermatozoa. The prostatic secretion probably does the same, although Steinach in his experiments on rats (confirmed by Walker) found that removal of the prostate, while not interfering with the orgasm, prevented, in some way, fertilization, although the ejaculatory ducts were left intact. Removal of the seminal vesicles weakens the fertilizing power. Cowper's glands simply increase the viscosity. That there is no specific function in fertilization in these fluids is shown by Ivanoff, who has taken spermatozoa mixed with a solution of sodium bicarbonate directly from the testicles and impregnated rats by direct injection in the vagina. Thus we find in the semen a fluid which increases the activity of the spermatozoa; in the vagina, a fluid which diminishes the activity; in the uterus, Fallopian tubes, and the abdominal cavity, secretions favorable to their vitality. The vaginal secretion is not normally sufficiently acid to inhibit life, but may become so abnormally, as in the uric acid diathesis. Spermatozoa have been found alive in the uterus and tubes until the following menstruation, twenty-five days after coitus (Dührssen) in the human female. In bats copulation takes place in the

fall and fertilization in the spring. In the receptacle for the semen in the queen bee spermatozoa have been found alive three years after coitus. In comparison Issner has determined that the ovum may remain alive for sixteen days after ovulation. Spermatozoa live for months in the male genital organs, and under suitable conditions will live forty-eight hours in the seminal fluid outside of the body. They travel at the rate of 1.2 to 3.6 millimeters a minute, and have been found in the uterus one-half hour after coitus. Rabbits have been impregnated two and one-half hours after coitus. Eight days after coitus spermatozoa have been found on the ovary. Lode claims that there are 221,257,000 spermatozoa in one ejaculation, while Howell has counted 70,000,000 in one cubic centimeter of spermiatic fluid. At this rate, 339,385,500,000 may be produced in a lifetime. The chemistry of the spermatozoon has not been completely established. It is known that in some kinds of fish (Burian) the head is composed of a protamin-nucleic compound together with lecithin, cholesterin and fats. What the inherent power may be, whether chemical or physical, which causes the fertilization of the ovum, will be discussed later.

Turning now to the ovum, the female element of reproduction, we find it carefully guarded in the Graafian follicle of the ovary, surrounded in order by (1) a mass of nutritional cells (discus proligerus), (2) a layer of parallel epithelial cells (corona radiata), (3) a strong membrane (zona pellucida), marked by striæ which in some fishes bulge at one point called the micropyle, and through which the spermatozoon enters and the main polar body passes out; (4) a transparent space (perivitelline space). The special function of each of these parts is unknown. The ovum proper differs from the spermatozoon in that it is made up of a nucleus surrounded by a mass of protoplasm (nutritional). This protoplasm has been separated microscopically into (a) an outer clear space, (b) a protoplasmic zone, finely granular, (c) a deutoplasmic zone composed of granules of different sizes and refractive power. Formerly it was suggested that the protoplasm of the ovum determined the sex of the individual, for in some insects the large eggs laid were found to bear females, and the small ones males. However, identical twins coming from the same ovum must divide the protoplasm into two parts, thus diminishing the total amount of protoplasm, and so the individuals should be both males, but in reality sometimes both

are females. The object, therefore, appears to be solely nutritional. The nucleus or germinal vesicle comparable to the head of the spermatozoon, and with which it unites, is composed of (1) a chromatin material or cytoplasm, similar to the protoplasm of the ovum, (2) chromatin substance. The vesicle contains half the normal number of chromosomes found in the nutritional cells of the particular species, and in addition contains a germinal spot, sometimes two. The vesicle is seen near the center of the ovum. There is no ameboid movement to the vesicle, but there is to the germinal spot. The chemistry of the female ovum has not been determined.

Such is our knowledge of the primitive ovum. Before, however, the ovum can be properly fertilized, it undergoes certain changes comparable to the development of the spermatozoon from the primitive spermatogonial cells. These changes have been called the maturation of the ovum. The vesicle approaches the circumference of the ovum. In the protoplasm appear two bodies called centrosomes, surrounded by radiations termed astrospheres or attraction spheres. These bodies being situated in the vicinity of the vesicle, the chromatin material of the vesicle collects into larger threads, the chromosomes, and the surrounding membrane of the vesicle disappears. Next the chromosomes arrange themselves equatorially between the astrospheres, each one dividing longitudinally into two and migrating to its respective centrosome, the remaining cytoplasm dividing into two unequal parts, making two cells. One cell passes out of the ovum and is called a polar body. Then a second polar body is given off in a similar manner, and the first polar body divides into two, and so three polar bodies and the matured ovum are formed. The polar bodies disintegrate, leaving only the ovum. This division into four nuclei is the same as the division of the spermatocytes into four spermatozoa, but differs in that the spermatozoa are all active, whereas only the ovum is active in the female. Nature's probable reason for this is that the ovum, being well protected, cannot be readily destroyed, but the spermatozoa, being exposed to outside influences and having a considerable area to travel, may easily be lost, thereby necessitating a larger number. Thus the ovum retains all its protoplasm, but loses one-half of its chromatic material and one of its centrosomes (Boveri). In the fertilization of the ovum this loss of chromosomes together with one cen-

trosome is replaced by an equal amount of chromosomes from the head of the spermatozoon, and the centrosome found in the middle piece completes the full complement of centrosomes and chromosomes necessary for subdivision. The maturation of the ovum begins as the ovum leaves the ovary. It is not complete until the spermatozoon has entered the ovum. In some mammals, however, maturation occurs in the Graafian follicle (Flint).

The spermatozoon and ovum now being fully developed are ready to undergo the process of fecundation. The sexual distinction of male and female seems to be the result of a process of evolution. From the most primitive of asexual reproduction we find the process of reproduction gradually becoming more complex as the organism becomes more complex, until eventually is reached the highest and most complicated type of all, the sexual, in which instead of a direct fusion of the two bodies and their eventual destruction and formation of two new bodies (asexual), these two different complex organisms produce independent living cells, which, by their fusion and growth, create a new living organism. Spencer offers as the cause of asexual reproduction the fact that fusion results in an increase of protoplasm at the expense of surface, thus forcing division, but the reasons for sexual differentiation do not appear so clear. Various explanations of this complex mechanism have been offered. For instance, it is supposed that it is necessary for the purpose of rejuvenating living substances, for it is seen in many instances that asexual reproduction continues for a certain period but eventually becomes extinct. Hensen thinks it is necessary to reproduce a new being to create a new life, and offers in evidence the fact that animals which reproduce parthenogenetically eventually die, whereas those same animals produced by male fertilization live and regenerate. Maupas has made similar experiments. Another suggestion is offered that a homogeneity of the species results by sexual reproduction which causes some variations and is constantly eradicating others and so striking a balance in the species. Whatever may be the reason for sexual reproduction we find in the higher types of animal life this method of union of the spermatozoon and ovum.

In order to bring about this union, nature has provided a series of phenomena, including ovulation, menstruation, and

the consequent male and female orgasms, ending in impregnation. Soon after the maturation of the ovum, which occurs one or more times a month with the expulsion of one or two ova at a time, these ova are cast from the ovary into the general abdominal cavity in the neighborhood of the Fallopian tube. The maturation of the ovum and its expulsion probably do not occur during pregnancy, but do during lactation, even without menstruation. What the causes of the rupture of the Graafian follicle are is not really known. The supposition is that the gradual increase of fluid in the follicle brings about (1) a condition of overdistention and consequent rupture; (2) that the rupture often results from the congestion of the ovary at the time of menstruation; (3) that it is brought about through coitus or sudden jars or falls. Following the rupture of the follicle and shedding of the ovum there is formed the yellow body in the remains of the follicle. Franckel claims that this body has a specific function; that the ovum being discharged two weeks before menstruation, a secretion from the corpus luteum prepares the uterus for the reception of the impregnated ovum; that the absence of the corpus luteum prevents impregnation. The product lutein derived from corpora lutea is at present used for suppressed menstruation and post-operative menopause by him with success. Born also considers corpora lutea glands with an internal secretion. These conclusions are purely theoretical. Whether the ovum is dropped directly into the Fallopian tube or into the general peritoneal cavity has long been a matter of doubt. It has been supposed by some (Haller) that at the time of the rupture of the Graafian follicle the fimbriated extremity of the tube grasped the ovary and the ovum was dropped into the tube. Others claimed (Howell) that the cilia of the tubes cause currents in the neighboring peritoneal fluid which currents bear the ovum toward and eventually into the extremity of the tube. Experiments of placing foreign bodies in the peritoneal cavity of animals near the tubes and later examining the uterus seem to point in favor of the latter theory, for these bodies have been found in the uterine canal several days later. This has also been accomplished where one tube has been removed and one left, and the foreign substance has been dropped on that side of the peritoneal cavity where the tube has been removed. The first theory is disproved by the fact that no erectile tissue is found in the fimbriated extremity of

the tube. Hargrave, however, claims that one of the fimbriæ is attached always to the outer angle of the ovary and that this forms a channel along which the ovum passes.

At about the time of the discharge of the ovum, generally, but not always, the uterus undergoes certain changes and menstruation results. That the two processes, ovulation and menstruation, occur generally at about the same time is manifest. All facts tend to prove that menstruation is comparable to the rut in animals, the one particular difference—that rut and sexual excitement occur at the same period in animals, whereas, in human beings they are independent, being simply due to domestication. This same change has been seen in dogs who become highly domesticated. In the rut of animals sexual excitement, menstruation, and ovulation all occur at the same period. That human beings still have the natural tendency to follow the habits of animals is evidenced by the fact that in animals impregnation occurs most often in spring. Human statistics show that the largest number of births are in February, with conception, therefore, in spring. We find also that the farther south the parents live the earlier the conception, which should be so, for spring is earlier. These facts point to the close relation of menstruation to ovulation. That the growing Graafian follicle, by nerve transmission to the uterus, causes changes in the uterus Strassman claims is certain. He has produced hypertrophy, swelling and congestion of the mucous membrane of the uterus, and bloody discharge by injection of salt solution into the ovary. The present claim, however, is that the relation of ovulation to menstruation is not through the nervous system, but through the circulation. The experiment of cutting the cord below the ovarian and uterine centers, thus shutting off all nerve supply to the ovary and uterus, has been tried and menstruation has been found to continue as usual. This fact has led to the conclusion that there is an internal secretion by the ovary. Proof of this is shown by (1) the loss of sexual characteristics when the ovary or testicle is removed in early life, (2) stoppage of menstruation upon removal of the ovaries generally, (3) injection of testicular extracts causes not only diminution of muscular and nervous fatigue, but also lessens subjective fatigue (Zoth and Pregel), (4) use of ovarian extracts said by some to relieve the symptoms of the menopause, (5) the effect on nutrition as seen in osteomalacia, where cases

have improved after removal of the ovaries, (6) removal of ovaries in dogs. There is a marked diminution in the consumption of oxygen (Richter and Loewy), the ovary thus producing a substance that increases the oxidation of the body.

That ovulation may occur independent of menstruation is shown by (1) pregnancy occurring in girls before menstruation has commenced, (2) pregnancy occurring after menopause, (3) menstruation occurring after removal of ovaries. Experiments have been carried out in animals, removing the ovaries and allowing the uterus to atrophy. These ovaries have been implanted in the same animal, with a return of menstruation. On removal of these same ovaries menstruation has ceased. Transplantation of ovaries from one woman to another has been accomplished by Morris with the return of menstruation. (4) Recent rupture of the corpus luteum has been found before, during and after menstruation. (5) Impregnation may occur during lactation without menstruation. (6) Impregnation may occur during a period of amenorrhea from disease. (7) Impregnation has occurred in the rudimentary horn of a uterus in which there has been no menstruation. (8) In many mammals the fertilized ovum enters into relation with an unaltered mucosa.

If menstruation and ovulation are interdependent as well as independent of each other, what may be considered the object of menstruation? In menstruation changes occur not only in the uterus but in the tubes, and there is a discharge of blood from both. The monthly discharge which occurs generally between 14 and 45, but may be earlier or later depending on individual idiosyncrasy, habits, and climate, is only a part of a profound physiological process which occurs normally in females every twenty-eight days. This change may occur in infancy or later than puberty or not at all. Accompanying it we find alterations in blood pressure causing congestion of ovaries, breasts, thyroids, parotids, tonsils, and skin, mental depression, increased nervous and vascular tension, increased elimination of urica, increase of temperature and increased heart action in strength and rate. The changes reach their maximum a few days before the flow begins, with a rapid fall at the time of flow, and a minimum at the close of menstruation, with a secondary less evident maximum a few days after. This rhythm may occur in males where coitus has not occurred, evidenced by nocturnal emissions following periodically.

Pflüger claims that the purpose of the menstrual change is to bring about a cleansing of the uterus to prepare it for pregnancy. Others, as Powers and Reichert, believe that it is an evidence that impregnation has failed, that it shows how nature prepares the uterus for the reception of the impregnated ovum, which event not occurring, the prepared bed is cast away. The latter theory would seem more plausible. Whichever may prove true, by menstruation the uterus is placed in a condition to receive the impregnated ovum. The ovum ready for impregnation has already been traced to the outer end of the Fallopian tube.

By the act of coitus and the orgasm of the male the spermatozoon is set free as is the ovum in ovulation, and these bodies swimming in the seminal fluid are normally deposited in the posterior fornix of the vagina in conjunction with the cervix of the uterus. How does the spermatozoon reach the ovum and where? That it travels by the motion of its tail is certain. That it may travel long distances under adverse conditions is evidenced by (1) impregnation with unruptured and supposedly imperforate hymen, (2) impregnation in unconscious subjects, (3) spermatozoa deposited simply on vulva and impregnation following, (4) impregnation with various mechanical defects and inflammations of the genitalia. The orgasm of the female does not appear to be of much importance. It simply excites conception and brings about an increase of the vaginal and vulvar secretions. Very many women are lacking in sexual excitement, especially after childbearing. Litzman claims that the progress of the spermatozoa is facilitated by the hardening of the neck of the uterus during the orgasm, its elongation and opening of the external os with eventual closing, thus sucking up the semen. By some it is claimed that progress is hastened by capillary attraction; others say by muscular contraction of the uterus. That the cilia of the epithelial cells lining the uterus and tubes indirectly aid is shown by experiments of Kraft, who has taken devitalized spermatozoa and placed them on the lining membrane of the oviduct, increasing thereby their activity. The function of the cilia waves may therefore be considered as twofold: (1) moving constantly from tube-end to uterus and from fundus to cervix, they bear the ovum toward the spermatozoa and the impregnated ovum to its decidual bed and (2) by their activity in stimulating the spermatozoa indirectly bear them to the ovum. The spermatozoon progresses through the uterine canal and along

the Fallopian tube, accompanied by many of its companions and bathed in its own fluid and that of the uterine and Fallopian mucous membrane secretions and eventually reaches the outer end of the tube, where that most peculiar of all phenomena—conception—takes place. That it occurs at the outer end generally and may occur on the ovary or in the abdominal cavity is now accepted, for spermatozoa have been found in these sites. Tubal pregnancy shows that the impregnation may, however, occur anywhere along the course of the tube. It probably does not happen in the uterus, for in rabbits by the time the ovum reaches the uterus it is covered with a thick, albuminous coat which the spermatozoa cannot pierce. The union of the spermatozoon and ovum is brought about by a peculiar attraction inherent in the ovum called chemotaxis, and not by mere chance. The spermatozoa, wandering along the tube, on reaching the neighborhood of the ovum are immediately attracted to it and cluster about it in large numbers. Experiments by Pfeffer, in which he found that in ferns the malic acid of the ovum attracted the spermatozoa would seem to point to some chemical affinity between the two cells. The ovum thus surrounded is eventually pierced by one or more of these bodies. Several spermatozoa may reach the perivitelline space, for the corona radiata has by this time disappeared, but only one really enters the ovum. Into the cytoplasm it then passes, carrying its head and middle piece and possibly its tail. Thus is formed an ovum with two nuclei, the so-called male and female pronuclei, each with its centrosome. The head of the spermatozoon gradually assumes the character of a nucleus, enlarges, and approaches the female pronucleus. Soon union takes place and one nucleus results, containing the proper number of chromosomes of the species, one-half from the male, one-half from the female, and each half occupying distinct and respective portions of the nucleus and refusing to mix (Van Beneden and Raekert). The impregnated ovum thus formed rests before further cell division. Later it begins to travel along the Fallopian tube, and by the time it reaches the uterine mucous membrane it has formed an amnion and from it protrude the chorionic villi, giving it the appearance of a rough, shaggy mass. The chorionic villi consist simply of a layer of protruding ectodermal cells called trophoblasts, for they have a digestive action. This action is in evidence when the ovum reaches the uterus, for there the tropho-

blast cells eat their way into the uterine mucous membrane, excavating a space for the insertion and nutrition of the ovum. They break directly into vacuoles or spaces containing maternal blood, and in this way obtain nourishment for the ovum (Peters). The ovum, therefore, is implanted, not on the uterine mucous membrane, but eats its way into the decidua, and is covered by it. The development of the embryo then begins.

Having traced the impregnated ovum to its final bed, there are left for discussion the questions, (1) What particular part, physical or chemical, is taken by the ovum and the spermatozoon in fecundation? (2) In what way is hereditary transmission brought about? (3) How is the sex of the individual determined? Recent experiments by Loeb (confirmed by Morgan) on sea-urchin and starfish rather conclusively prove that the fertilization of the ovum is a chemical process purely. He has succeeded in fertilizing the ova of starfish and sea urchins, producing healthy living larvæ by exposing the unfertilized ova to a dilute acetic acid solution, then transmitting them to hypertonic sea water and from this to ordinary sea water, after which process the ova develop into living larvæ. To accomplish these changes oxygen is necessary. Loeb concludes from this experiment that the function of the spermatozoon is purely chemical and that by its union with the ovum it carries into the egg some power to either destroy the material which prevents cell division, or, in itself, to directly cause cell division. The changes in the ovum occurring by reason of this artificial method of fertilization are in no way different from the changes resulting from impregnation with the spermatozoon of the male starfish or sea-urchin. Experiments by Wilson are also interesting, tending to show that definite portions of the ovum seem responsible for definite portions of the embryo. By cutting away different portions of the ovum before fertilization, then fertilizing the part remaining, he has succeeded in producing animals defective in certain elements. In experiments on molluscs, by cutting the ovum in two after fertilization he has produced two incomplete embryos.

Experimental evidence tends more and more to the conclusion that the chromosome bodies form the basis for hereditary transmission. Previous pregnancies, however, seem to have an influence on the present offspring. This may be seen in dogs where a bitch of good pedigree is crossed by a mongrel. On

being crossed later by a male of its kind the puppies will often show characteristics of the mongrel dog. The same may be seen in human beings where a woman with the second husband gives birth to a child with characteristics of the first husband. A pronounced case of this kind is reported where a white woman married a negro, her marriage with a white man later resulting in a child having negro characteristics.

Many experiments have been conducted to discover the factors which control the determination of sex, and there is much conflicting evidence. The conclusions of Morgan seem to sum up very accurately the knowledge of this very interesting subject at the present time. He concludes (1) that the sex is determined in the egg either before or after fertilization; (2) that all eggs have the elements necessary for either sex, in some cases the size of the egg determining the sex; (3) that in some species (aphids) change of food determines the sex and in bees the addition of spermatogenic chromatin determines the sex; (4) that the determination of sex lies in the nucleus and not in the cytoplasm; that the relative amount and size of the chromatin bodies may possibly determine sex; (5) that whereas the sex is determined in the egg there seems to be an even balance as to male and female, determination resulting from influences peculiar to different species and not to one common influence.

126 WEST FIFTY-NINTH STREET.

THE CAUSES OF STERILITY.*

BY

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THE fact that the low birth rate of this country is becoming a matter of national importance, and that researches are being made by prominent sociologists as to the cause, gives the subject of sterility a timely interest, even though the matter has been an ever-present problem to be solved since Rachel in biblical times sent up that despairing cry, "Give me children or I die." That cry has

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been echoed and re-echoed throughout the centuries down to the present day, but with the attainment of the highest types of civilization we notice the difference that, instead of sterility being an opprobrium as in former years, in the present state of society sterility is often regarded as a boon by our fashionable women. It is only among the semibarbaric races that we now find the pregnant woman pointing to her protuberant abdomen with pride, instead of shielding it with draperies for shame.

Englemann is the authority for the statements that the birth rate of this country is lower than that of any European country except France, and that the birth rate of the American-born population is much below that of France, and that the fecundity of the American woman is lower than that of the women of any other country. In spite of the progress of gynecic science, the number of children per marriage has decreased from 4.5 in the eighteenth century to 2.5 at the present time. We know that the sociological conditions under which our people live, especially those of the better class, have much to do with the diminishing birth rate, but, while voluntary "race suicide" is alarmingly prevalent, there is still that great multitude who, through no wish of their own, are childless, and spend their time and money in seeking relief. A large number of the patients coming to the gynecologist are seeking aid to get rid of the unwelcome product of conception or to be cured of their sterility.

In studying the subject of sterility we must first appreciate the fact that the man may be the cause of the trouble, either directly or indirectly, in a large percentage of the cases. This percentage has been variously estimated. Gross found it 16.2-3 per cent. in 192 cases; Brothers, 20 per cent.; Ries, 30 per cent.; Kehrer, 31.5 per cent.; Lier and Ascher found that out of 424 sterile marriages, in 169 cases, or 40 per cent., the fault was with the husband. Vedder of Christiania, in 310 cases, by including all cases in women due to gonorrhea derived from the husbands, found the man at fault to the extent of 70 per cent. This differs from the view held by the older writers, who taught that nine times out of ten the fault lay with the woman.

The sterility in which we as gynecologists are particularly concerned is that form which is attributable to some functional or organic defect in the woman which prevents childbearing. Sterility in women may be defined as the inability to conceive or to bring forth a living child. It may be well to define the various forms of

sterility: The inability to conceive is termed absolute sterility. When conception can take place but it is impossible to bring forth a living child, it is termed relative sterility. I shall limit my remarks in this paper to the consideration of absolute sterility. Absolute sterility may be congenital or acquired. Primary sterility is when a woman has never been able to conceive. Secondary sterility is when a woman has conceived but cannot do so again. Comparative sterility is when she can conceive but is unable to carry her child to full term.

The ratio of sterility varies according to the degree of civilization. In highly civilized races it is generally stated to be 10 per cent. In primitive races and even in rural communities it is much less. Thus, luxurious living, indolence, rich diet, and lack of exercise do not favor fecundity; while hard work, spare and simple food seem to go with fertility. In judging of this, however, it is well to remember the influence of the teachings of the Roman Catholic and Jewish religions among the poor, also their inability to procure illegal aid as readily, due to lack of money and initiative, and their not being influenced by selfish habits of luxury, may account to some extent for their greater fecundity. Mathews Duncan, in his work on sterility, states that a healthy woman living in wedlock all of her childbearing life under most favorable circumstances, should have ten children.

How soon after marriage is a woman to be regarded as sterile? Duncan found that the average interval between marriage and the birth of the first child was seventeen months, and that the likelihood of conception decreased proportionally thereafter. Only 25 per cent. of women bear their first child after four years of wedlock. A woman may therefore be regarded as presumptively sterile if she has not conceived after three years of married life during which time no preventative measures have been resorted to.

We know that the age of the woman has much to do with her fertility. The ova of the first and last twelve years of menstrual life are not as fertilizable as the ova of the middle period. According to Horrocks, a girl who marries between 13 and 25 is not likely to have children, or so many, as between the ages of 25 and 37, while from 37 to 49 she is still less likely to become pregnant. Many women, having previously borne children, do not conceive after 37, although living under the same marital conditions.

Incompatibility we must accept as a condition, as is proven by sterile marriages being followed by divorce and remarriage and both parties being capable of reproducing with their new partners. Darwin also proves this fact in certain animals.

To correctly study the many complex conditions that may directly or indirectly produce sterility, we must turn to the physiological process of conception. There are four essential factors necessary to a conception: (1) the production of healthy spermatozoa; (2) the production of a healthy ovum; (3) union of the spermatozoon with the ovum, thus starting segmentation; (4) implantation of the fertilized ovum in the uterine mucosa.

With the first factor, the production of healthy spermatozoa, we will not concern ourselves except to remember that with the exception of a few rare conditions, as congenitally nondeveloped testes, tubercular testes, etc., gonorrhea is the cause.

The second factor, the production of healthy ova, is important as a cause of sterility. Under this head we must class absence of the ovaries, imperfectly developed ovaries, and neoplasms. The absence of ova or healthy ova, as a cause of sterility from these causes, is of course obvious.

We know that the ovary is very prone to inflammatory processes, both acute septic and chronic inflammation due to passive congestion, as well as the result of sepsis. In cases of acute septic inflammation the ovary may readily be rendered useless as an egg-producing organ, or it may be so buried in adhesions that it becomes strangulated and its functions destroyed.

If subjected to long-continued passive congestion, whatever the cause, we find pathological changes occurring in its tissues. These changes are especially cystic degeneration, and also proliferation of the connective tissue elements, with resulting cirrhotic or cicatricial ovary, or, as is not uncommon, a greatly thickened tunica albuginea, which gives the ovary that smooth white covering which is impervious, thus preventing the liberation of the ovum through the bursting of the Graffian follicle. The causes of venous or passive congestion which give rise to this chronic inflammation are so well known to us that it is scarcely necessary to mention that subinvolution, retrodisplacements, prolapse, constipation, etc., may be indirectly causes of sterility by interfering with the production of healthy ova.

As in plant life we find certain seeds are incapable of germinating under any conditions, although seeds of a similar species dif-

fering in no apparent way will grow, it seems fair to reason by analogy that there are cases in the human subject where the ova produced by the ovary are not virile, and thus we may account for those cases of sterility where no tangible cause can be found.

We know that there are various influences which may temporarily suspend the function of ovulation. Any debilitating disease or prolonged or exhausting illness may be accompanied by amenorrhea and suppression of ovulation. A depressed state of the nervous system produced by grief, shock, fright, anxiety, or neurasthenia may act likewise. The rheumatic or gouty diatheses, syphilis, and chronic alcoholism or drug addiction probably cause suppressed ovulation by reason of nutritive defects.

The association of sterility with obesity is interesting, as there seems to be a direct relation between the ovarian function and fat formation. If an animal is castrated there is an excessive development of fat, a familiar fact to us in many cases of castration in women. Likewise, when the normal atrophic changes in the ovary incident to the menopause take place, a woman has a tendency to become obese. Consequently, if the ovaries for any cause become functionally inactive or atrophied, the woman is sterile and also obese. I consider, therefore, that the obesity is associated with the sterility as a result of the inactive ovaries, rather than the obesity being a cause of the sterility, as is often stated.

We note that women of a masculine type are very apt to be sterile.

The relation of food and environment to sterility must be here considered, as they seem to have much influence upon the fertilizability of the ova. It is unquestionable that the poor have more children than the rich. The woman who is brought up on rich food in excess, high living, no work or physical exercise, is less likely to be prolific than her hard-working, sparsely-fed sister.

Consanguinity or interbreeding is a well recognized cause of sterility, and probably results in the producing of nonfertilizable ova, their virility having diminished through the lack of an infusion of new blood.

Climate has an effect upon ovarian function and thus may influence fecundity. Women going to hot climates often note a decided increase in their menstruation, undoubtedly due to increased ovarian activity, and Horrocks makes the statement that women who are sterile often become fertile under such changed climatic influences.

In the third factor, which is the union of the spermatozoon with the ovum, we at once find that the preventatives to the accomplishment of this essential may be many and varied. The complex processes necessary to this end include the deposition of the spermatic fluid in such a part of the female tract that the spermatozoa may gain entrance to the uterus, while the channels must be unobstructed so that they may find their way into the outer end of the tube, there to meet the ovum and be incorporated as a part of this egg, that it may be fertilized and develop. Consequently any cause which mechanically interferes with the union of the spermatozoon with the ovule in the genital tract of the woman may be the cause of sterility. Such causes would be malformations of the vagina, uterus, or tubes. There may be absence, atresia, congenital narrowing or shortness, vicious insertion of the vagina, adherent labia, or abnormal communication between the vagina and the bladder, rectum, or urethra, neoplasms, complete prolapsus of uterus and vagina, vaginismus or vaginitis, causing dyspareunia, all of which by not permitting proper copulation may prevent the deposition of the spermatic fluid at the neck of the uterus. There may be atresia or stenosis of the uterine canal from caustics, bad operating, or endocervicitis. An infantile uterus, unicornuate or bicornuate uterus, nondevelopment of the uterine cavity due to arrest of development of Müller's ducts, or atrophy after curettage may mechanically prevent the upward progress of the spermatozoa. Flexions, versions, and neoplasms may all produce such leucorrhœal discharges, from the associated endometritis, that the virility of the male cell is destroyed and thus its goal is not reached. Extreme acidity of the vaginal secretion due to disease is a similar cause, as the spermatozoa require an alkaline medium.

Formerly flexions of the uterus were held to be frequent causes of sterility, due to mechanical obstruction as shown by the obstacle to the passage of a small uterine sound. But when we realize the size of the spermatozoa and their inherent tendency to "get there" under most adverse circumstances, it is not to be believed that they cannot pass any stenosis short of absolute atresia. If the stenosis will allow of the exit of menstrual blood it will surely permit the entrance of the spermatozoa. The sterility in antelexions is due to the attending endometritis, which is relieved by divulsion and curettage. The thick, tenacious mucus plug of cervicitis is more

apt to stop the progress of the spermatozoa than the stenosis caused by flexions. In anteflexion the pathology may be that of atrophic endometritis and is usually accompanied with imperfect development.

Neoplasms of the uterus may be the cause of obstruction. The Fallopian tubes may be congenitally absent. They frequently are impermeable, usually as the result of an inflammatory process extending from the uterine cavity, and causing also peritonitis with adhesions, with resulting distortion of the tubes. Occasionally tubercular salpingitis is the cause of their destruction. Simple catarrhal salpingitis, the frequent accompaniment of nonseptic endometritis, may result in desquamation of the ciliated epithelium and even closure of the ostia, and thus cause sterility. In the more severe types of septic salpingitis this is a very common accompaniment, as is the occlusion of the fimbriated extremity and the distortion and stricture of the tube by the peritoneal adhesions. Probably in the greater proportion of cases due to mechanical obstruction preventing the union of the spermatozoon with the ovum the site of the atresia is in the tubes and is the result of gonorrheal salpingitis. Tait contended that practically all women who have suffered from gonorrheal infection of the tubes are sterile. Thus the notorious sterility of prostitutes. This is due to the fact that the tubes rarely escape destructive lesions if they become infected with the gonococcus.

The fourth essential factor necessary to conception is the implantation of the fertilized ovum in the uterine mucosa or decidua. I believe that, excepting those cases due to mechanical obstruction in the tubes, the majority of the remainder do not conceive through failure in this part of the physiological phenomena of conception. The uterine mucosa, the endometrium, is particularly vulnerable as regards disease.

Scarcely any gynecological diagnosis is complete that does not include endometritis. We nearly always take it as a matter of course that there is a coexisting endometritis with all cases of subinvolution, flexions, versions, prolapsus, and neoplasms.

In the cases not due to direct infection, we consider that the endometritis is due to interference with the circulation of the uterus, especially passive or venous congestion. This condition, if long continued, results in well recognized pathological changes in the structure of this membrane. The most common type is with the proliferation of the glandular structures, with consequent

hypersecretion or leucorrhea. The proliferation of the glandular and connective tissue cells goes on with rapidity, and with the production of a poor quality of epithelium, embryonic in character, due to the excess of blood and to its being venous instead of arterial in character. Thus the smooth, glistening surface of a normal endometrium is changed to a greatly thickened, mushy, or shaggy surface covered with an excess of abnormal secretion, and it is not difficult to appreciate that with such a condition the process of implantation and proper nourishment of the ovum may be interfered with.

The impregnated ovum, on reaching the uterine cavity, sends forth trophoblastic processes, or villi, which by destroying or eating away the cells of the decidua, penetrate directly into the maternal blood spaces, and thus gets a firm implantation and secures its nourishment. In an endometrium greatly thickened by disease this effort of the projecting villi to penetrate to the blood spaces would naturally be rendered futile. Also the excessive secretion pouring forth from the utricular glands might possibly wash away the ovule or by its mere abundance prevent the ovum from coming into close contact with the cells of the endometrium. Sims found that in women suffering from dysmenorrhea, nearly one-half were barren, which means that the sterility was dependent upon the cause of the dysmenorrhea, the endometritis.

Ill states that fibroid tumors are the cause of sterility in 18.3 per cent. of his cases. Schoerler, Winkel, Gusserow, Rohrig, and others have also written of the frequency of fibroids as a cause. Here again I believe the sterility is due to the diseased condition of the endometrium as a result of the neoplasm, the process of implantation being prevented, or the secretions affecting the viability of the spermatozoa.

Where chronic inflammatory disease has invaded the deeper structures of the uterus, and we have the hard, enlarged, and sensitive organ familiar to us in chronic metritis, there is little hope of pregnancy, according to Ill. This is also a condition not favorable to implantation.

The association of sterility with an infantile uterus is very common. The defective development of the uterus prevents the implantation and growth of an impregnated ovum on its immature endometrium. Bumm believes that as many as two-thirds of the cases are due to defective development of the female genitalia. We frequently observe apparently robust women with well devel-

oped external sexual organs in whom the internal genitalia are infantile.

Grünewald has collected some interesting statistics bearing on the frequency of uterine disease as a cause. He excluded all virgins, widows, and those over 35 years of age in 1,500 cases. There remained 900 married women, of whom 500 were sterile. In about 200 of these the sterility was congenital, while it was acquired in the remaining 300, or 60 per cent.

In reviewing this classification of the causes of sterility, what has not been mentioned in the way of pathology? Nearly every anatomical or pathological deviation from the normal in all parts of the genital organs has been made to account for this troublesome condition. Yet we all know scores of instances where the above conditions have existed yet the woman is not necessarily sterile.

Unless there is a positive mechanical obstruction to the union of the male and female elements, Nature's strong tendency to perpetuate the species will overcome many pathological obstacles, and thus we often see women fertile under most adverse circumstances.

Brothers has reported two cases of women with bilateral salpingitis (pus tubes), the husbands at the time suffering from gonorrhea, who gave birth to several children. Probably the most marvelous case that is recorded is that of Koeberle, where there was an abdominal pregnancy after vaginal hysterectomy, through the means of a small fistula and a portion of remaining ovary. It is apparent that most of the cases may be classed as mechanical or pathological, or both. Many of the causes we have enumerated are self-evident and not debatable. These we need not consider further. As I stated before, I believe the majority due to mechanical obstruction are the result of salpingitis or salpingo-oöphoritis. I believe that a very large proportion of the remainder are due to the failure of proper implantation, on account of a diseased endometrium. Therefore I prefer to take a broad view of the subject and do not consider flexions, displacements, neoplasms, etc., *per se*, as direct causes, but rather regard them as factors, merely in so far as they cause the coexisting endometritis. I consider displacements in themselves as infrequent causes of sterility, but correcting the displacement will often cure the endometritis and so relieve the sterile condition. If we look for the most common causes of endometritis and salpingo-oöphoritis we

will place our finger on the most prolific causes of acquired sterility.

Gonorrhea, according to our present enlightenment, looms up largely as the great plague which is working so insidiously to depopulate our species. It is the cause of perhaps 90 per cent. of the cases of septic salpingitis and of septic endometritis. Morrow says of the pernicious effects of gonorrhea upon the procreative function, "its inhibiting influence upon the perpetuation of the species, which is the primary and fundamental basis of the institution of marriage, is by no means appreciated. While syphilis destroys the product of conception or blights its growth, gonorrhea is more radical and effective in its action; it renders null and void the procreative process by mechanical obstruction of the seminiferous tubes or oviducts, or by rendering sterile or unproductive the culture field of the ovum. Gonorrhea absolutely prevents what syphilis maims or destroys." He states further that gonorrhea is by far the most active factor in depopulation, while we have ordinarily regarded syphilis as such. Noeggerath states that 50 per cent. of sterility is caused by gonorrhea. Lier and Ascher found that out of 227 women, 121 were sterile because of gonorrhea. Koplik found that cervical involvement is not uncommon in the vulvovaginitis of young girls. How many cases of primary sterility are due to a gonorrhea insontium contracted in babyhood? Currier believes it has a distinct inhibiting influence on the development of the organs, and that many cases of sterility attributed to infantile uteri, are really due primarily to gonorrhea.

Next to gonorrhea I believe that endometritis and salpingitis as a result of sepsis and subinvolution following abortion, or labor, are important causes, especially of the so-called one-child sterility, in which case the woman is rendered sterile by disease of the appendages or endometrium resulting from sepsis incurred during labor. The subinvolution and chronic endometritis and salpingo-oöphoritis resulting from abortion is very common, and are therefore frequent causes of sterility. In my opinion this condition is largely due to the popular method of treating abortion expectantly, as though it were a physiological process, instead of realizing that it is a pathological one and treating it on surgical principles.

It is difficult in a paper of this kind to do more than take a general view of so complex a subject, but a conservative study of sterility leads me to the following conclusions, viz.:

1. That, as conception is dependent upon the four essential fac-

tors of healthy spermatozoa, normal ova, the union of the same, and the proper implantation of the fertilized egg, sterility is most frequently dependent upon acquired pathological lesions, and congenital defects, which defects and lesions produce sterility by interfering with one or more of the above-mentioned essentials.

2. That a large number of cases of acquired sterility are due to pathological lesions producing such destructive changes in the tubes and ovaries as to mechanically prevent the union of the spermatozoa with the ova.

3. That gonorrhea is the most frequent cause of such destructive lesions.

4. That acquired sterility, in a large number of instances, is due to chronic endometritis which produces such pathological changes in the endometrium as to prevent the proper implantation of the impregnated ovum.

5. That the cases of sterility associated with flexions, displacements, subinvolution, fibroids and other neoplasms, are due not to these conditions *per se*, but to the associated chronic endometritis which prevents proper implantation.

6. That a fruitful cause of an unhealthy endometrium and of tubal disease, which either singly or together tend to prevent union of the male and female elements and proper implantation, is the chronic inflammation and congestion of the uterus and adnexa incident to subinvolution or sepsis which so frequently follows abortion, especially if treated by the expectant plan.

7. That we must be impressed by the great importance of gonorrhea in its relation to sterility, when we appreciate that it not only renders the woman sterile, but is responsible nearly always for sterility in the male, gonorrhea thus being an etiological factor in about 70 per cent. of the cases.

8. That finally, as in nearly all instances of sterility in the woman due to gonorrhea, the infection has been innocently acquired by the wife from her husband, the fault lies with the man in more than two-thirds of all cases.

STERILITY AND ITS SURGICAL TREATMENT.*

BY

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STERILITY depends upon some defective performance of function in the generative organs of the male or female, in consequence of which the germinal elements either do not meet, are not generatively influenced, or if influenced fail to develop. At least 10 to 30 per cent. of the failures in fecundity depend upon some generative defect in the male. But as we are to consider here the question from a gynecological standpoint only, we will assume that the male is always normal and confine our discussion to the defective conditions of the female during her reproductive period.

The vault of the vagina is nature's selected area for the deposition of semen, and is so constructed as to encourage, for a considerable time, the complete immersion of the cervix in the spermatic fluid. Though it is the area of selection, it matters not on what part of the vaginal surface the fluid is ejaculated, when all conditions of the female are favorable. In fact, so active are the spermatozoa and so great is the affinity of the elements, under such conditions, that impregnation may occur when the semen is ejaculated only about the external genitals or transmitted by means of the finger to the vestibule of the vagina. Tumors of the vulva and tumors of the vagina may serve as obstacles to normal intercourse; but they seldom so occlude the genital canal as to prevent absolutely the passage of the spermatozoa. Intrauterine and cervical growths discourage pregnancy chiefly by their interference with the circulation in and about the uterus, making the endometrium an unhealthy nidus for embryonic development.

Atresia vaginæ varies in degree. In one instance we may have the vaginal tract represented only by a fibrous band between the bladder and the rectum. In another we may find part of the tract normal and the remainder imperforate, this imperforation varying in position. The uterus, tubes,

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and ovaries may be normal, rudimentary, or absent. When, however, the lower part of the vagina is imperforate and beyond it exists hematocolpos, or when the entire vagina is imperforate with an existing hematometra, we are justified in advising operative procedure with reasonable hope of relieving existing sterility; for the presence of either or both of these conditions is indicative of the existence of functioning ovaries, tubes, and uterus. The best operative procedure for the correction of such vaginal deformities is that suggested by Abbey. Its chief value consists in the technique he adopts of keeping the skin graft in apposition with the raw surface of the newly-created vaginal canal. He uses a French rubber pouch, stuffed with gauze, upon which are placed several strips of grafting skin, with their raw surfaces outward so as to come in contact with the newly-created vaginal surface. After several days the gauze is withdrawn, and soon after the pouch itself is removed.

Hematometra resulting from surgical injury to the cervix about the os externum at time of labor is rare, the author having seen only one such case, which was of seven years' standing. The surgical treatment demanded but a simple incision of the vaginal septum about the cervix, a dilatation and suturing of the vaginal and cervical tissues.

If ever laceration or relaxation of the perineum is in any way causative of sterility it is due to the insufficient support given to the upper structures, with resulting interference with pelvic circulation and consequent disease of the uterine mucosa. Likewise when sterility and intraabdominal tumors coexist, the mechanical obstruction offered by the tumors to the passage of the ovum is usually of less importance as a factor in the causation of sterility than the pathological changes in the tubes and uterus occasioned by the presence of the tumors. The surgical treatment of such cases is too familiar to be dwelt on. When there exists a thick septum dividing lengthwise the vaginal tract from hymen to cervix, proving a complete barrier to normal intercourse, sterility, in consequence, may or may not exist. If the pain occasioned by attempted intercourse is great, the female usually refuses all further advances, and if entrance of the penis into the vagina is required for complete sexual excitement on the part of the male, sterility will necessarily continue until the obstruction is removed. If, however, an orgasm occurs in the male, on external contact only, fecundation may

follow. The following cases are illustrative of the condition described:

CASE I.—Mrs. M., aged 25, married one year, strong and healthy, functions all normal, but every attempted intercourse proved most painful, and its accomplishment was impossible. As the husband, an athlete of unusual physical development, demanded complete contact for sexual excitement, their sexual relationship was most unsatisfactory. Examination showed a thick, resisting septum dividing the vagina lengthwise. This septum, which extended through the uterus, was removed as far as the cervix. Intercourse was then accomplished, and pregnancy immediately followed.

CASE II.—Mrs. R., aged 30, married ten years, three children. At the time she came under my care there existed a very thick but yielding septum, extending from the vaginal outlet to within a short distance of the cervix. The thinner portion of the septum, that near the cervix, was torn away during childbirth, and its remains could be traced along the anterior and posterior walls. According to the patient's statement, attempted intercourse before the birth of her first child was most painful, and the complete act was not accomplished. However, frequent seminal emissions followed incomplete sexual contact, resulting in impregnation.

Atresia of the hymen is not very uncommon, but is sometimes mistaken for the blind end of the Müllerian vagina. In this latter condition the perforate hymen will be found pushed backward and hidden by the bulging of the vaginal sac. Adhesion of the labia minora may also resemble atresia of the hymen and be mistaken for it. Sterility, of course, accompanies all these anomalies, and the operative procedure for their relief is simple and familiar.

Defectus vaginæ is usually associated with absence of the uterus, tubes, and ovaries, and deserves no further consideration than to be mentioned. A very long or very short cervix and shallow vagina are anatomical defects not uncommonly believed to be the causes of sterility. But to consider any of these conditions important factors in causation of sterility seems inconsistent with the accepted view of the vitality and persistent activity of the microscopic male element. The determination of cause depends upon something more than the mere discovery of frequently associated conditions.

Stenosis of the os offers of itself practically no obstruction to the ingress of the male element. When this condition exists, as is usual in an exaggerated form of ante flexion, it may be, and almost always is, a contributory factor in the causation of sterility; not through direct obstruction to the passage of the male element, but by its interference with the free exit of the menstrual flow, which in turn causes an engorgement of the pelvic vessels and eventually renders the uterus unfit for the performance of its physiological functions. If the canal is sufficiently open to allow the menstrual discharge, it is sufficiently open to allow of the passage of the spermatozoa, and the theory of mechanical obstruction under these circumstances would seem fallacious. Sims' experiment would also tend to disprove such a theory, as out of fifty-five injections of the seminal fluid through the cervical canal into the uterine cavity he succeeded in accomplishing but one impregnation. It is agreed that sterility is frequently associated with stenosis of the cervical canal; and it is a common observation that pregnancy often follows dilatation, especially when accompanied by curettage; but the rational explanation of this result is that the dilatation of the canal insures better drainage of the uterine cavity and restores a healthy pelvic circulation, while curettage removes the diseased uterine mucosa discouraging to embryonic development. The endometrium is reproduced in about two months after aseptic curettage. When it is acted upon by strong acids and other escharotics, resulting in sloughing, the endometrium is but imperfectly reformed, even after three or four months. In both cases the membrane is reformed chiefly from the cells of the connective tissue above the muscular fibers. Chloride of zinc may destroy the connective tissue layers and no reproduction of the membrane follow. But an operator, with average care, rarely injures the connective tissue and usually leaves islets of mucosa which become the centers of new epithelial growths. The uterine glands dip down even into the muscular layer and may become additional sources of epithelial regeneration even after a severe curettage, as their bases are difficult to reach with the sharp curette.

Patency of the canal is best insured by Davenport's hard-rubber stem. After dilatation and curettage this instrument is anchored with permanent sutures in the cervical canal and not removed until after the second menstruation following the operation.

The stem is slightly curved, $1\frac{1}{2}$ to 2 inches in length, $\frac{1}{4}$ inch in diameter for its entire length. It has no groove and the mucous membrane of the cervical canal comes into direct contact with the entire stem surface, and the menstrual blood flows between the mucosa on the one side and the instrument on the other. Stems with one or more grooves on their surface are supposed to insure open drainage; but in fact the cervical mucosa will invariably enter and more or less fill up all such intended drains. The menstrual flow will occur between the apposed surfaces and is not encouraged by grooves. The chief advantages of Davenport's stem are its large diameter and uniform pressure.

When the uterus develops but slightly beyond the infantile stage, as in uterus pubescens, where the body and cervix are practically of one size, menstruation is scant and irregular and soon ceases. Here sterility is common, but by the use of general tonics, intrauterine electrical stimulation, exercise and proper nourishment, menstruation may be reestablished and also the possibility of fecundity.

The infantile uterus is commonly associated with chlorosis, a small heart, and a general hypoplasia of the whole vascular system. When such is the case, the condition is practically hopeless, the specimen here shown being illustrative of such a case.

During the process of ovulation, the pelvic circulation becomes more or less engorged, with an accompanying increase of peritoneal secretion in this immediate region. In this fluid, and that contributed by the ruptured Graafian follicle, the ovum is deposited and conveyed to the cilia of the fimbriæ. Its transmission is encouraged by the wave action imparted to the fluid through the varied and constant motions of the body, especially those of breathing and peristalsis of the intestine. In turn the fimbriated extremity is influenced by this fluid and wave action, it being transformed into a more open net, constantly in motion searching prescribed areas for a migrating ovum. When the ovum meets the fimbriæ it is carried through the tubes by direct action upon it of the cilia waving in the direction of the uterus, or by the current created through the constant action of the cilia. Thus the ovum possesses no independent means of propulsion corresponding to that of the spermatozoa, and depends for transmission upon forces external to itself. When the ovum is expelled from a follicle near the pole of the ovary, to which the

ovarian fimbria is attached, it probably is immediately influenced by the cilia; but if it is expelled from a follicle at the further pole, its distance of travel is greater and its chance of escape is increased. The ovum then may be immediately transmitted to the cilia, may float about and not meet them for several days, or may escape altogether and be reabsorbed by the peritoneum.

The sources through which infection may reach the pelvic peritoneum and prove destructive to the functioning of the uterine appendages, are varied. It is now commonly accepted that sterility may follow puerperal and gonorrheal infections, but little or no attention has been given to the involvement of the ovaries and tubes from appendicitis. The degree of damage to the sexual organs from this source depends not only upon the severity of the infection, but also upon the position of the appendix. Appendicitis is, of course, more likely to involve the right uterine appendages than the left, or than both. But at times both right and left are so completely involved as to prevent all possibilities of conception. The following illustrative case is one of two occurring in my experience:

Mrs. D., aged 21, married six months, had been severely ill ten days previous to my first visit in October, 1902, with intense pain through pelvis and temperature ranging above 103°. Vaginal examination revealed a tender mass in the posterior cul-de-sac; tumefaction extended through the entire posterior pelvis. Diagnosis of appendicitis was made on the presence of a mass and by exclusion, her previous history giving no evidence of miscarriage or gonorrheal infection. Two weeks after my first examination, and when acute symptoms had subsided, I opened the patient's abdomen through the median incision, and found a purulent vermiform appendix situated at the lowest part of Douglas' pouch, surrounded by the tubes and ovaries and firmly agglutinated to them. After the removal of the appendix, the uterine appendages, much thickened and engorged, were freed from the surrounding structures. The patient made an uneventful recovery, but has never become pregnant. It is probable that the injured peritoneal surfaces of these organs reunited with the adjacent denuded surfaces in such a way as to interfere with the transmission of the ovum.

Six cases have come under my observation where the right appendages alone were seriously involved, three where they were agglutinated to the appendix and the left appendages were also

completely enveloped by the sigmoid flexure. In none of these cases was there evidence of infection through the genital tract. The cause of pelvic involvement could be clearly traced to infection through the alimentary canal alone. Slight adhesions following appendicitis about one or both uterine appendages, without necessarily affecting their functioning, are of frequent occurrence and serve to illustrate the constantly existing possibility of serious consequences to the functioning of the genital organs from such a source. I am convinced that appendicitis is a factor in the causation of sterility more important than it would at first seem. This opinion is based upon the result of considerable abdominal work with especial reference to this subject. During the past six years it has been my custom to operate for appendicitis in the female through the median abdominal incision, believing that this route gives better opportunity to examine and correct associated pelvic lesions, while it offers no difficulty in attacking the disease itself. The agglutination of both right and left uterine appendages under these circumstances will, of course render the patient positively sterile by the obstruction offered in both tubes to the passage of the ovum. But if one alone is involved, sterility may or may not follow, as the ovum can pass through the other tube; yet as the endometrium is always more or less affected by tubular or ovarian disorders, sterility may result from unhealthy uterine mucosa indirectly caused by appendicitis. Positive sterility will also exist if there is tubal obstruction on one side from appendicitis and on the other from salpingitis due to uterine infection, or from an involvement of the latter side as the result of an acute inflammatory process in the large intestines about the region of the sigmoid flexure. Surgical treatment here resolves itself into curettage and removal of the appendix through the median incision, and dealing with resulting or associated pelvic complications as the teachings of conservative surgery at the present day demand.

Prolongation of life is, of course, the primary consideration of all operative work; but when diseased tubes and ovaries are involved, the question of conservative work upon them to continue ovulation and encourage fertilization also deserves earnest consideration. Direct inflammatory invasion of the tubes through the uterus is usually destructive to the greater portion of the tube, and not infrequently this invasion extends

to the ovary and may partially or completely destroy it. Such an infection may not only destroy the greater portion of one tube and ovary, but extend along the peritoneum and seriously affect the functioning of the opposite appendages, even to the extent of causing permanent sterility. When the distal portion of the tube has been removed by operative procedure, and no special effort made to insure the patency of the canal, this canal may or may not remain open. If closed, fertilization through this tube is, of course, impossible. If open, pregnancy may occur. The several reported cases of pregnancy following the supposed removal of both tubes and ovaries suggested to the surgeon the wisdom of preserving all tissues which may take part in the reproductive process. The recognized surgical treatment after removing the distal portion of the tube is to split open longitudinally the remaining stump and insure its patency by suturing the peritoneum to the mucosa of the tube. The diseased portion of the ovary is dissected away and the remaining healthy part is sewed together and anchored as near as possible to the stump of the tube.

The length and mobility of the tube allow the fimbriæ a very wide range of motion, while the partial attachment of this extremity to the nearer pole of the ovary prevents the fimbriæ, during their excursions, from wandering beyond the radius of ovarian influence. If, as appears, nature has conceived a definite purpose in the length and mobility of the Fallopian tube and the peculiar structure of its extremity, then it would seem both rational and advisable to preserve as much as possible of the healthy portion of this appendage when it is found partly diseased. Infection in the tube usually destroys the fimbriated extremity; in a mild infection, however, we may have only a limited portion of the ampulla involved and the fimbriæ unaffected. When the latter condition exists, it is both feasible and advisable to remove only the diseased portion of the tube, preserving the fimbriated extremity and uniting it to the remaining portion of the tube as is now advised by some surgeons.

An accessory tubal ostium may enter into the pathology of reproduction, as when this ostium fails to communicate with the lumen of the tube and forms a blind sac. Such cases are supposed to be somewhat uncommon, but are of sufficient importance to be considered. Should the fertilized ovum find lodgment in the cul-de-sac and there develop, we have resulting one

of the several forms of ectopic pregnancy. But a moderately diseased tube, though not sufficiently constricted to prevent the passage of the spermatozoon, yet sufficiently stenosed to discourage the passage of the fecundated ovum, is probably the controlling factor in the causation of tubal gestation. Ectopic gestation in turn influences markedly the future possibilities of pregnancy. The inflammatory action, with resulting lymph barrier which limits hemorrhage, commonly found accompanying such abnormal developments, almost invariably occasions an involvement of the opposite uterine appendages sufficient to seriously interfere with their functioning and to render the woman positively sterile unless the condition be surgically corrected. Ill has five times removed the product of tubal pregnancy without sacrificing the tube. One of these cases again became pregnant and was delivered at term. But the wisdom of leaving tubal tissue which has undergone certain destructive changes by pregnancy, may be fairly questioned, the one pregnancy following in these cases having possibly occurred through the opposite tube. Several cases are recorded where the tube was removed and pregnancy followed. Ill himself reports one case where he removed a tube containing a fetus and opened a closed tube on the opposite side, with resulting pregnancy and delivery at full term. Failure of the impregnated ovum to find its natural nidus may be due, as stated, to a constricted condition of the tube; and it seems only rational to conclude that failure may also be due to partial absence of the ciliated membrane. If, therefore, complete or partial destruction of the cilia follows tubal gestation, the removal of the fetal contents only is, in my opinion, not advisable. The future usefulness of the area involved ceases because of the destructive process which has taken place in it, and if this portion is reconstructed into a tube, a repetition of ectopic gestation may occur. The route of operation for ectopic gestation should be selected, not only with the object of relieving the immediate cause of distress, but also of correcting and adjusting to the best advantage all accompanying or resulting abnormalities. The area of the tube involved should invariably be removed, leaving only a supposedly healthy stump which in turn should be opened and made patent by the suturing of its inner and outer coats. In the opinion of the writer the preferable route is the median abdominal incision.

Uncomplicated displacements of the uterus are discouraging to fecundity only in direct proportion to the amount of disturbance they occasion in the uterus and tubes. In whatever position the tubes are placed, provided marked engorgement of them does not take place, transmission of the fecundated ovum through them is possible, and the uterus can develop this ovum in any position it assumes provided its lining membrane is healthy. Endometritis is a common sequel to both retroversion and antelexion, but engorged tubes are usually found only with retrodisplacements. Permanent correction of a retrodisplaced uterus undoubtedly favors pregnancy, as it establishes perfect drainage and restores normal circulation; but a pregnancy begun in a retroverted uterus may attain maturity without external aid. The treatment of antelexion and its usual accompaniment, stenosis of the os uteri, has already been dealt with. Uncomplicated retrodisplacement may be satisfactorily corrected by any of the varied methods of shortening externally the round ligaments; but when complications exist the restoration and readjustment of the organs is best accomplished through the median abdominal incision. Personally I prefer the intra-abdominal shortening of the round and broad ligaments, a method devised by me and described before this society in 1891. But whatever method of restoration is used, curettage should always precede, as in a majority of cases it is imperative for the healthy condition of the uterus.

The practice of transplanting a healthy portion of a diseased ovary into the body of the uterus near the split oviduct is worthy of consideration. Transplantation at this point is advantageous because ovulation will then occur within the immediate vicinity of the cilia of the tube. But if, in transplanting the ovary, it is completely surrounded by uterine tissue, fecundation is impossible, as the matured ova cannot escape.

It is never advisable to detach and transplant an ovary when we can shift its position and anchor it near the tube without undue tension. Transplantation of the ovarian structure from one patient to another has recently been successfully accomplished by Dr. Robt. T. Morris.

What bearing, if any, has the sexual excitement of the female upon her fertility? It certainly is not essential, though it may enter as a factor. The secretion of the vagina is acid, and when excessively so it acts detrimentally upon the vitality of the

spermatozoa. When slightly acid, which is the normal condition, it is practically neutralized by the alkalinity of the spermatic fluid. If, then, the sexual excitement of the female enters into the process of fecundation at all, it must enter by stimulating the cervical glands to an increased flow of mucus, which, encouraged in expulsion into the vagina by the orgasm, aids the spermatic fluid in neutralizing an excessively acid vaginal secretion. This sudden stimulation of mucus in the cervix may also tend to dislodge a thick and tenacious plug often found in the canal, which plug retards the progress of the spermatozoa. In treating for sterility cases of excessive acidity the sound should be first passed through the cervix to assist in dislodging the mucus plug, and shortly preceding intercourse a bicarbonate of soda douche should be used.

THE FUNCTIONS OF THE UTEROSACRAL AND ROUND LIGAMENTS.*

BY

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IN my endeavor to define the functions of these uterine ligaments I am not unmindful of the wide divergences of opinions in this respect. I trust I will not plunge this section into an endless and perhaps profitless discussion of the subject of uterine supports. Each of us, no doubt, has notions on this subject that are fairly fixed and realizes that the same exist in the minds of others. Yet the very fact that an attempt will be herein made to define the function of some of the ligaments, presumes directly to oppose the theory that the ligaments do not support the uterus and that its position is entirely maintained by the intraperitoneal vacuum. It seems to me such a theory carries with it the probability that an organ placed in a position in the body so dependent as that of the uterus, that is so movable in every direction and at the same time has in proportion to weight more ligaments than any other organ, should have no use for them as supports. Inasmuch as destruction of this

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vacuum by abdominal or vaginal celiotomy does not change the position or plane of the uterus, and as ligament shortenings are eminently successful in correcting faults in either position or plane of that organ, it would seem this theory must be considered disproven. Further evidence of its being insufficient to maintain the position of this organ is found in the fact that such faults in the organ as deep cervical lacerations produce retroversion, and when properly repaired the proper position is restored. And still further, other lesions of the fasciæ about the uterus occurring commonly from dystocia are unquestionably causes of such malpositions as retroversion and prolapse of the organ. Again, it might consistently be asked what is the nature of interference with the action of this vacuum that produces uterine displacements?

I believe it must be conceded that the broad ligaments constitute the principal factor in maintaining the plane of the uterus. This is due to their strength, fixed pelvic wall attachments, and their firm and broad attachment to the organ. Their obliquity in the pelvis, considered in conjunction with their great breadth from Fallopian tube to vagina, their structure, strength, and tension show that they exert a strong influence toward maintaining the forward position of the uterus. This influence, however, is not sufficient in itself, nor is it, aided by intraabdominal pressure, enough to maintain a forward uterine position. Were they sufficient we would never regard as justifiable any of the many round ligament shortening operations, ventrosuspension, or ventrofixation, or for that matter any shortening operation on any structure other than the broad ligaments.

In addition to the broad ligaments we have others at either pole of the uterine axis that have some function. In these latter we find exerted the greatest possible leverage. These ligaments are attached at practically the poles of the long uterine axis. In those attached near the lower pole, the uterosacral and utero-vesical ligaments, we have formed a strong diaphragm punctured by the neck of the uterus at about the junction of the posterior and middle thirds.

It seems fairly clear that the round ligaments bear no part directly in supporting the uterus. And even the part played by them would be far less or less sufficiently executed were it not for the marked auxiliary action of the unusual elasticity

of the peritoneum attached to the convex sides of the ligaments. One can easily note that the uterus is not elevated by contractions of the round ligaments. By hooking a tenaculum into them at their uterine ends and carrying them each toward the internal abdominal ring of the corresponding side, which is practically the fixed point of either ligament, it is plainly seen that no elevation of the uterus along the pelvic axis occurs. It may well be stated here, in order to combat the incorrect observations that have been published to the effect that shortening the round ligaments by the Alexander method forces the uterus downward. This statement was based upon the introduction of an index finger into the vagina just before drawing the ligaments out into the inguinal canals. The cervix was felt at first forward under the bladder. In pulling the fundus forward by means of traction on the round ligaments exerted in the inguinal canal, the cervix was carried backward into the hollow of the sacrum. During this sweep it passed along the examining finger and gave the false impression of being forced into the vagina.

The round ligaments are largely muscular, though receiving a considerable connective tissue support from the attached peritoneum. Their attachment to the pillars of the internal inguinal ring, to the inguinal canals, to the labia majora, and to the pubic spines gives them their fixed point for exercising their influence upon uterine position. As they contain some striped muscular tissue it has been supposed they were to some extent under the influence of the will. This has not been demonstrated, however, and may well be doubted. Yet one may easily understand how such action might be of value as an auxiliary in evacuation of the bladder. Their curved direction may well be considered as best in order that the bladder, in distending gradually, may rise up between them. It is under such relation to them, compressed near the top of the dome and, therefore, easily grasped by them when contracting in unison. The bladder in distending also increases the anteroposterior diameter, and therefore as the front of it is steadily in contact with the anterior abdominal and pelvic walls, the body of the uterus must be forced backward. This stretches the round ligaments and the peritoneum attached to their convex sides, causing them to constantly resist further bladder distention. When the different agencies together produce evacuation of the bladder, these ligaments and peritoneum contract coordinately and again bring

the uterus forward. They also tend to hold the fundus forward as the size of the early pregnant uterus increases. They thus hold the fundus against the anterior abdominal wall, preventing loops of intestine and omentum from insinuating themselves between the anterior abdominal wall and the fundus. The advocates of Alexander's and other round ligament operations have probably assigned too much importance to the small size of the portion of the ligament in the canal. This portion taken in conjunction with the portion attached to the ring pillars, and the attachments along the canal, I believe, amply compensate for the small size of the canalicular portion of the ligament and probably make the extraperitoneal portion as strong as is the intraperitoneal part of it. It is probable that the chief function of these ligaments is to hold the uterus in such forward position as to exert the least strain upon the supporting broad ligaments. They are, then, ligaments of position rather than of uterine support. The uterosacral ligaments, attached to the posterior aspect of the supravaginal portion of the cervix, and running backward as connective tissue bands including a small amount of involuntary muscle fiber, are attached to the sacral vertebræ from the second to the sacroiliac synchondrosis. As each leaves the cervix it spreads out into a broad fan-shaped structure adherent to the adjacent bones. It, taking this osseous attachment as its fixed point, acts to hold the cervix backward in proper juxtaposition to the hollow of the sacrum. The uterus has lateral fixed or pivotal points corresponding to the center of effort of the broad ligaments acting upon it. These, necessarily, are not fixed points, as the tissues are yielding, but theoretically they may be so considered. Acting upon these pivotal points the uterosacral ligaments by preventing forward displacements of the cervix, normally, lessen the tendency of the fundus of the uterus to be displaced posteriorly. Thus it will be seen they unite with the round ligaments in maintaining the uterus in a strong inclination forward, notwithstanding the tendency to backward displacement normally existing. They have still another function acting in conjunction with the uterovesical ligaments. They together form a strong, elastic diaphragm in the vaginal roof that not only supports the bladder, thus affording a soft and comfortable bed upon which the uterus may rest, but act as a director of the lower uterine pole. These two sets of ligaments appear to be antagonistic so far as their

traction upon the uterus is concerned. The remainder of the vaginal roof assists in making up this diaphragm, which can easily be recognized by looking at it through a speculum. By placing a woman in Simon's position and making anteriorly or posteriorly to the cervix an opening into the peritoneal cavity, one notes cessation of the ascent and descent of this diaphragm with respiration, just as long as the air is allowed to pass through the opening made. He also may note that, although the intra-abdominal tension is entirely removed, the position of the uterus remains normal. One can then see effectually the action of the different ligaments. The function of these ligaments may be modified materially by abnormal development, by injury, or by general relaxation of the soft structures. The principal abnormality of development I have encountered has been the malpositional attachment of them to the uterus. This has consisted of the uterosacrals being attached to the uterus too near the pivotal point mentioned, thus decreasing their leverage, and very often complicated by the attachment of the uterovesicals at a point too distant from the same point, thus materially increasing their leverage. This results in an unequal traction on the cervix in the anteroposterior direction, all in favor of the anterior ligaments, resulting in marked anterior displacement of the cervix. This permits the intraabdominal pressure to be exerted parallel to the uterine axis instead of at ninety degrees to it. This necessarily means prolapse and retrodisplacement of the uterus and consequent stretching of the round ligaments. With injuries to the uterosacral ligaments resulting from dystocia, practically the same results are noted. If the general relaxation is noticeable in the uterine ligaments we note prolapse of the uterus and then retroversion. In deep cervical laceration we find the diaphragm is no longer active, and the uterus sags downward in the pelvic axis. To me it seems very plain that with the cervix held well back in the hollow of the sacrum, retrodisplacements can never occur except in extraordinary cases like the development of large tumors that push the fundus backward before it. With the cervix permitted to float forward, prolapse and retrodisplacement of the uterus are inevitable, even if ventrofixation of the body be done. In one of my cases the fundus was firmly fixed to the anterior abdominal wall while the cervix protruded from the vulva. The uterus was then stretched so much as to have a length of eight inches.

A CASE OF MENINGOCELE OF UNUSUAL SIZE.*

BY

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(With one illustration.)

HERNIA of the meninges is not a very rare deformity in the newborn. The size of the tumor in the present case, however, seems to me of sufficient interest to warrant this report.

Erickson, in his "System of Surgery," speaks as follows: "Congenital hernia of the membranes of the brain is sometimes met with in the form of meningocele, or of encephalocele. In the former, the protruded sac is filled with fluid; in the latter, it contains also cerebral substance. The diagnosis between the two conditions is generally difficult, and is of little practical importance. The disease is usually speedily fatal." Z. Lawrence finds that of thirty-nine instances in which it occurred, twenty-one were males, eighteen females; that the protrusion may vary from the size of a pea to a tumor exceeding that of the child's head; and that the occiput is its chief seat, of seventy-nine cases, fifty-three being in this situation. The hernia may occur at any of the unossified points of the skull, and has been observed, in a case described by Lichtenberg, to protrude from the base of the skull through the mouth. Surgery offers little in these cases, though in one instance Paget used injections of iodine with success; and in another, when sloughing of a portion of the tumor was taking place, Anandale applied a ligature to the pedicle and removed the tumor, the child recovering completely in spite of an attack of measles. In another case, the portion of brain was successfully sliced off, the patient surviving.

Simple meningocele, when the coverings of the brain protrude through the skull, forming a cyst filled with a clear fluid, is most frequently met with. Next in frequency, the hernial sac contains, in addition to the fluid, nerve-elements or brain-

*Read before the Section on Gynecology of the College of Physicians of Philadelphia, April 19, 1906.

substance, the distended posterior cornua of the lateral ventricles. Least frequently is found the encephalocele. All these tumors, as a rule, are located in the occipital region.

Holt says that in meningocele, when the tumor is covered by integument, the prognosis is good. The consensus of opinion is that, if possible, it is better to attempt no surgical interference until the infant is three to six months old. Two methods of operation are resorted to: (1) The Injection Method; (2) Excision of the Tumor.

(1) In the first method, a needle is inserted into the side of the tumor, and a portion of the fluid withdrawn. Iodin so-



Meningocele.

lution is then injected for the purpose of obliterating the sac Morton's fluid, consisting of iodine, gr. ix; iodide of potassium, gr. xxx; and glycerin, oz. $\frac{1}{2}$, is recommended by some.

(2) The excision method is now frequently resorted to. The operation is performed by making an elliptical incision on each side of the growth. The hernial sac is then opened and dissected away, and a ligature is placed close to the bony foramen. The integument is then made to cover over the stump.

Report of Case.—September 15, 1903, I saw, in consultation, the patient, less than one day old.

Family History.—The father, aged 38, was born in America. Good family history. No specific or tubercular taint. The mother, aged 36 years, was born in America. Family history negative. She had had two children, living and healthy. Her last child, born September 13, 1905, was our patient.

The family physician told me that the labor was not complicated. This fact seems surprising, because of the size of the tumor. It occupied the occipital region and preceded the birth of the vertex. The tumor showed marked evidence of contusion, probably brought about by cervical pressure.

Physical Examination.—The child was normal in size, slightly emaciated. About an inch below the posterior fontanelle was a distinct pedicle, which supported a large hernial tumor. The hair of the scalp was continued on the neck, and extended some distance over the tumor. The skin showed patches of ecchymotic discoloration. The tumor, for the most part, had a thin wall and was transparent, except at the neck. On pressure, one elicited marked fluctuation. The tumor exceeded the infant's head in size. The longest diameter, was about six inches; transverse diameter, about five inches; diameter of opening in occipital bone, about one inch. The infant seemed to suffer no inconvenience from the growth, except when its position was changed or when the tumor was pressed upon; then the child would cry out.

Operation.—The radical cure by amputation of the sac was performed on September 15, without anesthesia. An incision through the skin at the neck of the tumor was made, and the sac exposed. The intracranial fluid was then slowly withdrawn. The infant showed marked evidences of shock, became pale, and for a time ceased to breathe. These symptoms, however, soon disappeared. The hernial sac was then dissected away, and closed in with a continuous suture of cat-gut. The skin was sutured with the same material.

The infant made a rapid recovery from the operation. It gained in weight, and seemed to be well for three months, when it began to develop acute hydrocephalus. As the head increased in size, the body lost in weight. The infant is now six months old, is poorly nourished, and has the characteristic separation of the sutures and the large bulging fontanelles.

ADENOCARCINOMA OF THE ABDOMINAL WALL, DEVELOPING SUBSEQUENT TO THE REMOVAL OF BENIGN OVARIAN NEOPLASMS.*

BY

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(With two illustrations.)

MALIGNANT tumors not infrequently develop in the scar tissue of the abdominal incision after laparotomy. The histogenesis of such growths is well understood, and follows the general principles of tumor formation. There is, however, a peculiar type of adenocarcinoma sometimes appearing in the abdominal wall after ovariectomy for benign tumor, notably multilocular cysts, which is difficult to classify, and which is not explicable by the ordinary pathological processes.

These growths have recently been carefully studied by Polano, who collected seven typical cases from the literature, and added one of his own. The following case coming under the writer's observation is added as the ninth reported instance of this unusual tumor formation.

The patient, M. B., 27 years, married, nullipara, was admitted to the Gyneccean Hospital, March 12, 1905. She was a patient of Dr. H. D. Beyea, to whom I am indebted for the clinical material. Menstrual history as follows: Puberty at 15, flow regular and painless, lasting four to six days, excessive in amount. Leucorrhea slight. General appearance, well nourished. Weight, 148 pounds. No headache; sleep, appetite, and digestion good. Bowels regular. Urination normal. Previous history good—no rheumatism, no fever. Family history negative. Seven years before admission patient had been operated upon by Dr. E. W. Hedges at the Muhlenburg Hospital, for a multilocular ovarian cyst. The cyst was tapped, drawn through the abdominal incision, and removed. The stump was treated with the Paquelin cautery and the wound closed without drainage.

*Read before the Section on Gynecology of the College of Physicians of Philadelphia, April 19, 1906.

Recovery was uneventful, save for a stitch-hole abscess. The patient remained well until two years ago, when she first noticed pain in lower abdomen, sharp and stabbing in character. Three or four months later a small lump appeared in the center of the incision and rapidly increased in size. At the time of admission she had pain on the right side of abdomen and around umbilicus; no nausea, no vomiting, no chill or fever, no cough, dyspnea, or edema. There was progressively increasing swelling of the abdomen.

On March 13, 1905, celiotomy was done; there was removed from the space between the peritoneum and rectus muscle,

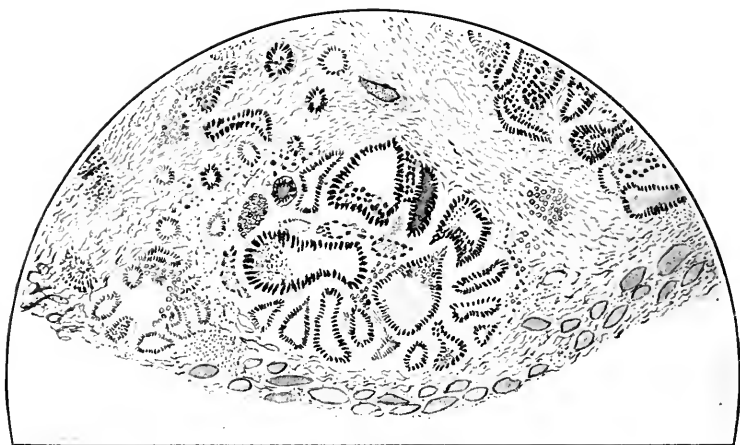


Fig. 1.—Adenocarcinoma of Abdominal Wall. Note the uniformly typical gland structure.

a tumor the size of a large cocoanut. The growth was excised, the peritoneal cavity being opened during the course of the operation.

The convalescence was uneventful, but the patient remained well but a comparatively short time. Some six months later she was readmitted to the hospital and several recurrent nodules were removed. The patient then rapidly failed in health, and is now in the last stages of cachexia.

Specimen consists of a large tumor developing between the muscle and fascia in the abdominal scar of a laparotomy. The growth is reniform in shape and measures 14 cm. in length,

7 cm. in width, and 7 cm. in thickness. It lay with its long axis parallel to the long axis of the body, and was densely adherent to muscle, fascia, and peritoneum. The surface of the tumor is covered with shreds of tissue, muscle, fascia, fat, etc. The growth itself is possessed of a dense, firm capsule, having a rather free blood supply. Upon section the tumor exudes a serous fluid. The consistency is in general fibrous, but areas of soft caseous tissue are scattered throughout the growth. The cut section is of a pinkish-gray color. At the upper end of the mass, a large cavity, 7 cm. in diameter, is noted. This is entirely filled with yellow, cheesy necrotic tissue. Several minor cavities are scattered throughout the growth.

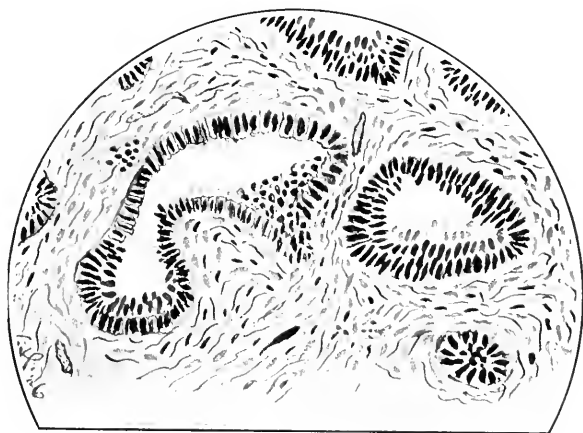


Fig. 2.—Adenocarcinoma of Abdominal Wall. Note the perfectly formed glands and the close resemblance of the growth to a primary ovarian carcinoma.

Microscopically, the growth consists of a well-developed connective tissue framework, rich in cells, which enclose and surround many areas of glandular tissue. The glands, simple tubular or branched, are uniformly lined with cylindrical epithelium, the nuclei being large, deeply stained, and situated at the bottom of the cell. In many glands the lining membrane is penetrated by the proliferating epithelium, which is heaped up in the surrounding connective tissue. There is generally but one layer of cells lining the gland, but in many instances proliferation has gone on until there are several layers discernible.

The blood-vessels are fairly numerous, their walls well developed, arterial in type. Around the central area of degeneration of the tumor is noted much necrosis of the tissue, but no other change. Occasional areas of muscle and fat are present. The entire picture is that of an ovarian adenocarcinoma, extremely rich in well-formed glands and cells, and held together by a rich celled connective tissue framework.

The points to be noted in this case are these: Ovariectomy for multilocular cystadenoma seven years previously, the cyst tapped and drawn through the abdominal wall; absolute latency of tumor elements for seven years, with a then rapidly-growing tumor of the abdominal wall.

Examination of the abdominal wall growth proves it to be highly malignant in character, and histologically corresponding closely in type to an adenocarcinoma of the ovary, with rapid emaciation, recurrence, and cachexia. It is at once apparent that ordinary processes of tumor development in scar tissue do not obtain in this case. The long period of freedom from invasion of the scar (seven years) with the then very rapidly-growing tumor, composed of highly specialized glandular elements, rather tends against the belief that the growth may have been primary in the abdominal wall. That the growth may have sprung from the urachus is possible, but this source is ruled out by the fact that the growth was entirely without the peritoneum (lying between it and the muscle), and that membrane was everywhere intact. There remain then three methods of development. First, an adenocarcinoma primary in some other organ than the ovary, with metastasis to the abdominal wall. Next, that the ovarian cyst was not carefully examined and contained carcinomatous areas with a resulting implantation of cancer cells into the incision. (This is combated by the very long period of latency.) Or lastly, that cells from benign ovarian growths may have become implanted on the tissue of the abdominal wall, and after a long period of absolute quiescence have suddenly become active and undergone malignant alteration.

These modes of development are carefully discussed by Polano, but he too fails to come to a definite conclusion concerning such growths.

In reviewing the reported case one is struck by the length of time intervening between the primary operation and the de-

velopment of the abdominal tumor. In the eight reported cases, the period ranges from 4 months (2 cases) to $7\frac{1}{2}$ years. The average time was 2 years and 4 months. In the case under discussion the period of latency was at least 5, possibly 6 years. This factor is a strong point against a recurrence of a primarily malignant tumor, or a metastasis from a primary growth elsewhere, unless it be granted that the primary growth had its inception sometime subsequent to the original operation.

The fact that, in the case in which this special form of glandular carcinoma of the abdominal wall is found, the primary growth was always a benign ovarian cystoma (in most of the cases a multilocular cystadenoma) is, while perhaps a coincidence, still a point in favor of some especial manner of development of these growths.

Of the 8 collected cases, 6 were typical pseudomucinous multilocular cystadenomata. One was a unilocular papillary-cystoma, and one was a papillary pseudomucinous cyst. Of the secondary abdominal wall growths, seven were adenocarcinomata, strongly resembling adenocarcinoma of the ovary; one in addition to the gland tissues contained scirrhus areas, while Polano's own case was a complicated tumor showing typical adenomatous areas, with some fields distinctly of sarcomatous change. This highly-organized type of neoplasm is very strong evidence against the growth being primary in the abdominal scar. "All primary tumors develop by means of a proliferation of existing cells, in combination with a new formation of blood-vessels" (Zeigler). There being no tubular glands lined with a single layer of cylindrical epithelium in the deep abdominal parietes, the growths cannot be primary there. As has been stated, the position of the tumor, extra-peritoneal with no involvement of the peritoneum, proves that it could not have developed from the urachus. We are left, then, two possibilities of histogenesis—that the ovarian cyst was primarily malignant with a direct implantation of cancer cells into the abdominal wall at the time of operation, or that the cells of a multilocular ovarian cystadenoma may, after a period of latency (when introduced into tissues rather inimical to their growths), take on individual malignant change and develop tumors such as have been described.

The former mechanism is somewhat unlikely, since glandular carcinoma very rarely fails to recur, or if directly planted

upon living tissue to develop in a comparatively short period of time. Five and seven years seems too long a period of latency when the usual history of such tumors is taken into account. That benign cells may remain latent for long periods and then undergo rapid proliferation with malignant change is well authenticated; for example, Fischer reports an embryoma of the thigh, which first made its appearance in a woman of 51 years. The individual cells were purely embryonal in type.

To sum up, then, we have a peculiar, highly specialized glandular tumor developing in the abdominal parietes some time after an ovariectomy for glandular cystoma. This phenomenon has been observed in eight similar cases. In all of these cases, with the exception of my own, careful histological examination of the cystoma was undertaken, and in no case was any evidence of malignancy discovered. The growth does not follow the ordinary principle of secondary tumor development, and for that reason it is fair to conclude that some more complex genesis underlies these formations. In default of a better solution, Polano's conclusion must be agreed to, that this special type of tumor has its origin in the direct implantation of benign cells, which, after a varying period of latency, develop in their new seat malignant changes with rapid proliferation.

15 PELHAM ROAD.

THE LIFE AND WORK OF DR. J. MARION SIMS.*

BY

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IN these days, filled with new discoveries and continuous advancement the busy practitioner is apt to lose sight of the prominent figures of the past, the pioneers who laid the foundations upon which the present generation is building. It is of much service to all of us to pause occasionally for a few moments, to look back as well as forward, to see what work our great fore-runners did, what obstacles they overcame, what trials and difficulties they passed through, and how they did it.

*The facts of this paper are taken largely from Dr. Sims' autobiography, and from the essays of those who knew him.

In the branch of gynecology the man who was in reality the founder is he whose statue may be seen to-day in the halls of "The Woman's Hospital," in New York City, Dr. James Marion Sims. But he was not a New Yorker by birth. He came from Lancaster County, South Carolina, and he spent all of his early life in that part of the country. He was born in 1813, and as a boy he does not seem to have given many signs of his great genius which was to make such a stir in the world later on. Those were the days when the schoolmaster was all supreme. He wielded his birch more vigorously and more regularly than now, to the great advantage of the growing generation, and Dr. Sims tells many an interesting anecdote in which the birch played no mean part.

Marion Sims started going to school when he was six years old. He went to a boarding school seven or eight miles from his home. Marion Sims' school days lasted until he was seventeen, then he went to Columbia, South Carolina, where he attended the University, graduating in December, 1832.

He was not a remarkable student in any way, and, when he graduated, did not know what he wanted to do. His father wanted him to be a lawyer, his mother thought he would make a fine minister, but he was not inclined to do either. In those days men who had a University education were expected to take up a profession, and he felt especially bound to do so, as his father was a poor man and had been able to send him to college only by making great sacrifices. But, as Sims did not wish to be a lawyer or a clergyman, the only thing left was to be a physician. At this time and again later, even after he had his degree, he would have been glad to give up his profession and to secure a good business opening. Marion's father was greatly disappointed when he learned that Marion would not study law, but he agreed to his studying medicine.

A boy of nineteen, he started in with Dr. Churchill Jones, the only doctor in town, and began to read medicine in his office, but after being with him only a short time, he went to Charleston for one winter, and after that to Philadelphia, where he finished his medical course at Jefferson, receiving his degree in 1835. He had done a large amount of dissecting during his course, and, after he graduated he took an extra six weeks' course in practical anatomy. So, as he himself says, he felt

that he could tie any artery in the body without difficulty, but about giving drugs he knew nothing.

Thus equipped the young doctor went home and hung out his sign. Dr. Jones had left town, so he was the only doctor, and about two weeks later his first patient arrived. Mr. Mayer was the town's chief tailor and one of the prominent people. He came in one morning and told Sims, whom he had known all his life, that his baby was sick, and asked him to go up and see him. Sims went and found the baby suffering from summer diarrhea. The new practitioner had no idea what to do for it, but told the mother to send down to his office in an hour and he would have some medicine ready. In his library of seven books he had Eberle's Diseases of Children. He took it down, read through the section on cholera infantum, and then mixed up the first prescription mentioned there. He sent it up to the house and in the afternoon went up to see how the medicine was acting. There was no change in the baby, so he changed the medicine, and again the mother sent to his office. He made up another prescription from Eberle, and again watched the results. They were no better, the baby grew steadily weaker and finally died. Sims was perfectly heartbroken. About two weeks later he had a second case. It was very much like the first, and in a few days it died, too. This was too much for Marion Sims. He went home, took down his sign, went to an old dry well behind the house and dropped it in. He was no longer a doctor in Lancaster.

Dr. Sims did not know what to do now, but finally decided to go to Mount Meigs, Alabama, where he heard there was a good opening. His life at Mount Meigs and in that vicinity turned out very happily. An old doctor was just planning to leave town when he arrived, so Sims bought out his practice, giving him a note, as he had no money. He soon became well acquainted and very popular and began to pick up a good practice. A little later he enlisted in a volunteer troop that went to the Seminole war. There were over a hundred young fellows in it and, when they reached home, the young doctor had a hundred good friends. After he had been at Mount Meigs a short time, he decided that his prospects were good enough to warrant his marrying a wife. He had been engaged for several years to Eliza Theresa Jones, a girl of his native town, who had been his sweetheart ever since he was ten years old. He went back

to Lancaster, where they were married, and then returned to Mount Meigs.

The success of the young benedict continued. Dr. Blakey, who was a large planter as well as a physician, and lived about ten miles away, offered to take him into partnership. The offer was so good that Sims could not but accept, and the newly-married couple moved out into the country, where they had a log-cabin, with one room, to which he afterwards added a second. Here they spent some of the happiest days of their lives, and two of their children were born to them. The doctor had a large practice now, in fact, was making about \$3,000 a year, but malaria came upon them to destroy their happiness. First he was attacked and barely escaped with his life, and then his wife and children came down with the disease. This was more than they could stand. They had a lovely home, delightful friends, and a good income, but what were all these when compared with health? Where to go they did not know, but finally decided on Montgomery, and in December, 1840, they reached there. Sims' first year in Montgomery was a hard one, for he and his family were sick most of the time. Malaria had gotten too firm a hold on them to leave immediately. Of course he could do little work and so had to live on credit. The second year his health was much better and he began to build up a good practice. His taste was always surgical, and after three or four years he was known as the first surgeon of the city, and he had about as much to do as he could take care of. His surgery of that time was along general lines, as was shown by his first contributions to the medical journals, which were on general subjects. He was always a good mechanic, and his inventive genius was such that if he needed a certain instrument for some particular operation, he was always able to devise one. He was the first man in the South to cure club-foot by operation, and was the first to discover the pathology of trismus nascentium. The first case he ever reported was one of hare-lip.

In June, 1845, after ten years of practice, Dr. Sims saw his first case of vesicovaginal fistula. Dr. Henry sent for him to help him with a case of labor that had already lasted three days. They applied forceps and delivered the child without much difficulty; but five days later a large slough came away and leakage of urine followed. Sims went home and looked up the literature upon the subject, found that it was universally

pronounced incurable, and wrote to that effect to the girl's master. Within two months, two other cases of vesicovaginal fistula came to his notice. Both were slaves, and to both the masters Sims gave the same answer as before, that they were incurable; but before he had sent the last of these slaves, Lucy, home, he made a discovery. A lady was thrown from her horse and struck on the end of her spine. She immediately suffered from severe pain in the back and sent for Dr. Sims to relieve her. When he reached there and examined her, he decided that she had suddenly displaced the uterus by her fall, and that was causing the trouble. This was the first time he had ever seen a case of uterine displacement, and all he could remember was that Dr. Prioleau had said, "Place the patient in the knee-chest position, introduce one finger into the rectum and the other into the vagina, press up and pull down, and if you do not succeed in getting the uterus back in this way, you will not in any other." So Sims got her up in the knee-chest position, introduced one finger into the vagina and began to work around on the uterus, but it seemed as if he could not reach the cervix well, so he introduced a second finger and began his manipulations again, when suddenly the cervix, which he had been manipulating, disappeared; he could feel it no longer and the lady exclaimed, "There, doctor, the pain is gone; I am all right now." Sims did not know what had happened; his fingers felt as if they were inside of a hat, the bottom of which he could not reach; but the woman was relieved, so there was nothing further to be done. As the woman turned back on her side, there was a little explosion, as if gas had passed from the rectum, but it came from the vagina, not the rectum. The lady was very much embarrassed and apologized profusely, but Dr. Sims told her that the gas was not from the rectum, but was simply air passing from the vagina and then he realized how the uterus had been replaced. As he was working around with two fingers in the vagina, they had become separated a little at their base; the air had rushed into the vagina and the atmospheric pressure had ballooned out the vagina and replaced the uterus. As he was going home thinking of this thing, he began to realize that he had made a great discovery, for by letting the air bulge out the vaginal walls they could be seen as they never had been seen before. At this very time Lucy, his last vesicovaginal fistula patient, was in his little eight-

bed hospital waiting to go home; but Sims decided he would have another look at the fistula before she went and would see what it looked like by his new method. He bought a spoon on his way home and bent the handle of it, so as to hold back the vaginal walls with it. He was in a hurry to know what he could see, so picking up a couple of students, they all went out to his hospital. He told Lucy he wanted to make one more examination before she went home. They got her up on the table in the knee-chest position and the two students lifted the buttocks upwards and outwards; the air immediately rushed into the vagina and ballooned out its walls; he retracted the perineum with his bent spoon and there lay the whole vagina before them as clearly to be seen as if on the surface of the body. There was the fistula on the anterior side, a small ragged hole leading into the bladder. Why could that not be healed? Sims decided that it could; all he would have to do would be to pare the edges and bring them together, then drain the urine off and it would heal. So he kept Lucy in his hospital and sent for the two other cases he had seen and pronounced hopeless. He also managed to get hold of two or three more cases, so that he had a little group of six patients in his hospital, and upon these he began to operate. It was about three months after his first discovery before he devised the instruments he needed and had these made. Then he performed his first operation. He pared the edges of the fistula, brought them together with silk and used a bit of sponge to drain the bladder. When he came to examine the case a few days later he found that he had failed. The edges had not united, and the bit of sponge was covered with phosphates and very firmly attached to the neck of the bladder. He had to remove his sutures and tear the sponge away by main force. This tore the walls of the bladder, besides causing great pain, as this was before the days of anesthesia. Dr. Sims saw at once that sponge was not the thing with which to drain the bladder; he would have to devise some other kind of a self-retaining catheter. It was in December, 1845, that Dr. Sims performed this, his first operation for vesicovaginal fistula, and it was June, 1849, three and a half years later, before he succeeded in healing the first of his cases. He, from the very first, was able to make the openings very much smaller, but the line of union always gave way at some point. All this time

he was making constant improvements in his instruments and methods. First, he perfected a self-retaining catheter, then he devised the use of shot, so that he could fasten his sutures higher up than it was convenient to tie, and, finally, he conceived the idea of using silver wire as a suture. As soon as he began to use silver wire success crowned his efforts. This was long before the date of antiseptics and asepsis, so that his sutures had always become infected and so failed to give perfect union, but with silver wire everything remained perfectly clean. There was no contamination of the urine and Anarcha was healed on the first attempt. In two weeks time Lucy and Betsey were also healed and the goal, which had been sought so long, was at last reached. Vesicovaginal fistula, which for years had defied surgery, was at last conquered. This injury is rare to-day, so that it is hard to appreciate how great a blessing was this discovery; but in those days, when labors were allowed to last for days, the injury was quite common and made the life of the sufferer so unbearable that Dr. Sims had really, by his discovery, conferred a great blessing on womankind. In the *American Journal of the Medical Sciences* for January, 1852, is Dr. Sims' own description of his operation, with illustrations of his methods and instruments. The article is so perfectly clear that anyone who has the operation to do to-day should read it and follow his directions as closely as possible. The operation has never been improved upon, but there are few men living to-day who can perform it. It was in 1849 that Dr. Sims finally succeeded in curing a vesicovaginal fistula. Everything then seemed to be favoring him; he had a large practice, a loving family, and everything he could desire, but very soon the wind turned. During these years of his experiments he had been quite well, but now he began to suffer from chronic diarrhea, a disorder very common in his locality. Gradually he grew worse and his friends thought he was going to die. He gave up everything and began to travel, with the hope of curing his trouble, but he found that, though he succeeded in stopping the diarrhea temporarily, as soon as he returned to Mobile the old trouble came back. Finally he made up his mind to move. His friends, his interests, his practice, his all, were in Alabama, but he could not live there; so they had to pack up and make an entirely fresh start in life. He sold his house and lot and other possessions and went to New York, reaching there in May, 1853, more dead than alive.

During the next two years Dr. Sims slowly regained his health. Dr. Emmet tells of how he first met Dr. Sims when seeking shelter from a snowstorm, and how he never expected to see him again alive. But he did gradually improve, suffering some set-backs, but always picking up again and going ahead. He needed all the strength he could possibly get, for the hardest struggle of his life was before him. A man forty years old, he came to New York, having made a wonderful discovery, having had a splendid practice, well known to the profession at large by the articles he had published; and yet, for two whole years, he could not get enough to do to pay for his daily bread. After he had been in New York a year and a half, his wife went back to Mobile and had to raise money there to pay their living expenses. When he first came the doctors were interested; he demonstrated his operation to them, he lent them his instruments, he taught them how to operate, but instead of referring cases to him, they took advantage of what he had showed them, tried to do the work themselves, and then called him a quack and a charlatan.

He saw that he had to find a way to show the public what he could do or else he would fail, and from this necessity came the inspiration to found a hospital solely for the diseases of women. Dr. Sims became acquainted with Mr. Henri L. Stuart, a bright, active, energetic newspaper man, and succeeded in interesting him in the movement. He told Mr. Stuart what he wanted to do and then placed himself in his hands and did just what this gentleman said would be best, in order to carry the scheme through. In the first place they rented Stuyvesant Hall for an evening and then had little notices put into all the papers, saying that Dr. Sims would address a meeting of doctors and laymen, on the necessity for a hospital, in the City of New York, for the treatment of the diseases of women. Cards of invitation were sent to all the prominent doctors and they came. There were about two hundred and fifty at the meeting. Dr. Sims read his paper, the meeting endorsed the project, and a committee of five doctors and five laymen was appointed to consider ways and means. This was only a beginning, however, and it took a year of hard work before the hospital was actually started. It was the women who accomplished the movement for him. He succeeded in getting some of the leading women of New

York interested. A board of lady managers was made up. They raised the money and rented a house for their temporary quarters. The hospital was opened on May 1, 1855, with about thirty beds. It was a success from the start and was always full though opposed by all the eminent men in the profession. It was a charity—all the beds were free. Soon the hospital and Dr. Sims were known far and wide; and the fame brought him private, as well as hospital patients; it gave him success.

For the next six years he worked along steadily as head of his hospital, operating all the time, studying the results, perfecting his methods and dropping what he found worthless. There was a vast field before him and one that had been but little trodden. Until Sims gave to the world his speculum, a good view of the vagina, cervix, and os had never been had, so that the diseases of the female organs of generation had only been guessed at, and to most of the symptoms a false pathology had been assigned. All this had to be straightened out, and it took years of work and many workers to do it, but Dr. Sims, while at the head of the Woman's Hospital, was the one to make the start. At the same time that he was working so hard in his profession, he was also using his best efforts to have a large hospital built instead of the temporary quarters, which they were renting. He visited the legislature in Albany several times, besides working with the Mayor and Aldermen of New York City, and finally succeeded in obtaining a grant of land for the site of the hospital. The plans were drawn up, but before they were completed he went abroad to visit the foreign hospitals and to learn what of their details he would like incorporated in his own hospital. It was in 1861 that he made this trip, and while he was abroad the Civil War broke out. He returned to this country in 1862, but only for a short time, for being a Southerner, he was greatly disturbed by the war and decided that he would rather have his family in Europe than in this country, while it lasted. So he took them over, intending to spend the summer there himself and to return in the Fall. He found, however, that he could make a comfortable living in France without any difficulty, so he stayed there with his family until the war was over.

Dr. Sims' first trip to Europe was like a triumphal march. His fame had gone before him and he was received everywhere with every honor and distinction. The great surgeons brought

him cases of vesicovaginal fistula to operate upon and he demonstrated to them, again and again, his method of cure. It was successful in every instance. In France he became especially prominent on account of the rank of some of the people he cured. He speaks particularly of one of the cases there that he operated on for Dr. Nélaton. The operation was going nicely, when suddenly they noticed that the patient had stopped breathing (chloroform was being given). Dr. Nélaton assumed charge of the case and ordered her to be inverted—completely inverted. Dr. Johnstone put her legs over his shoulders and held them straight up in the air, head falling downwards; Dr. Campbell supported the thorax; Dr. Hubert forced the mouth open with a spoon and drew the tongue well out with a tenaculum, while Dr. Beylard performed artificial respiration. For twenty minutes this was kept up before there was any sign of natural breathing, then it slowly returned, only to stop again, as soon as she was placed in a horizontal position. The same things were repeated and again they succeeded in getting her to breathe. The operation was completed without further anesthetic. A week later, when examined, the line of union was found to be perfect. It was his great success in France, on his first trip, that caused him to return there. His fame was such that in 1863 he became physician to the Duchess of Hamilton and he spent the summer in her château at Baden Baden. Afterwards he was the physician of the Empress Eugénie. While enjoying these positions, Dr. Sims had more leisure than in New York, and that summer he wrote "Clinical Notes on Uterine Surgery," the only work that he ever published. The teachings of this book were so radically different from the established teachings of the day that it aroused much opposition, but in two or three years it had revolutionized gynecology.

This great man's work was appreciated thoroughly while he was abroad and he had a very easy and successful career there, but he wanted his children to live in America and so, in 1871, he returned to New York and once more took up his work there. In 1872 he was reappointed to the staff of the Woman's Hospital, but in 1874 he resigned and his resignation was accepted. The Board of Managers of the Hospital and he were at variance, because he always invited to his operations any doctor who wished to learn his methods. Dr. Sims was not con-

nected with any medical school, but in this way he taught, and the more physicians there were present, the more widely did his methods become known, and thus more good was done. His invitations were accepted generally, and many physicians, both from this country and from abroad, came to see him operate. The Board of Managers claimed that the presence of so many outsiders shocked the modesty of the patients, and accordingly they made a rule that not more than fifteen spectators should be present at any one operation, and Dr. Sims resigned. Thus a great hospital, which had taught the world, gave up its wonderful opportunity for teaching, and let the greatest man of his time leave them, and all on the flimsy pretext that a patient who was entirely unconscious under an anesthetic could have her modesty shocked. Dr. Sims was greatly hurt by this rule, which was plainly directed against himself, especially as it was a time-honored custom that the surgeon was autocrat in the operating room and could invite whom and as many as he pleased. A little more than twenty years before he had been striving, with all his might, to get the hospital started; he had interviewed personally almost everyone of the Board of Managers and had asked them to take their position and to lend their energy and support to the work. It was chiefly through him that the Potter's Field was given them as a site for the Hospital and that appropriations, amounting to upwards of \$60,000, were made at different times by the Legislature; it was his work that had made the hospital famous throughout the world; but now, when the hospital building had been erected for ten years and the great difficulties were passed, they asked their founder to leave. Such ingratitude is hard to imagine; but history repeats itself, and not so many years later the same scene was presented at the Gynceean Hospital, in Philadelphia.

What the medical profession of America thought of Sims' resignation was shown very clearly, when, at the meeting of the American Medical Association that year, he received the greatest honor they could bestow and was elected their President. He still continued his residence in New York, though he traveled much. In 1877 he went back to his old home in Lancaster County, South Carolina, which he had left years before, after losing his first two patients. He also went to Charleston and to Mobile. His journey was like the return of the conqueror;

he was heaped with honors wherever he went and his countrymen showed that they, at least, appreciated his work.

In 1881 he suffered from a severe attack of pneumonia, which was almost fatal; but he rallied from it, though he felt himself crippled by it ever afterwards. In 1883 he went to Washington and bought a lot there, where he intended to build and live. He returned to New York, intending to sail for southern Europe on November 8, but his departure was delayed by a prominent lady, who wished him to operate upon her. He performed the operation with his usual skill and success and the lady was cured, but when, on the evening of November 12, he returned from seeing her he began to complain of great restlessness. He sat up late that night and would not go to bed. His wife, who was with him, suddenly noticed that he was breathing with great difficulty, and called to their son in an adjoining room; but before he reached there Dr. Sims was dead. His life was over, but his work lived after him and still lives. He blazed a new trail over which many of us to-day are trying to find the way. He laid the firm foundations upon which others are still building. The plastic surgery performed by him and Dr. Emmet, his assistant and successor, has never been equaled since they left the field of active labor. To-day the dash and daring of abdominal surgery seems to attract every one and the injuries to the pelvic contents, so commonly brought about by parturition, are often overlooked and neglected. Here is still a great field for the young surgeon, and I hope this review of Dr. Sims' life and work may stimulate some of us to try to follow his example in plastic surgery.

18 GROVE PLACE.

SYMPHYSEOTOMY WITH THE REPORT OF FIVE OPERATIONS, AND A BRIEF CONSIDERATION OF ITS ADVANTAGES AND DISADVANTAGES.

BY

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HISTORY.—The first symphyseotomy of which we have any knowledge, was performed in 1644, by Jean Claude de la Courvée, a French physician practising in Warsaw, Poland. This operation was performed after the death of the mother, for the purpose of saving the child. A similar post-mortem section was performed in 1766 by Joseph Jacques Plenck, of Hungary. To Jean René Sigouet, of Angers, France, however, belongs the credit of originating the operation as applied to the living subject. In Paris, in the year 1777, he successfully operated upon a rachitic subject having a flat pelvis with a conjugata vera of 6.5 cm. Following this operation the subject was taken up with great enthusiasm and at the end of the following year eleven operations had been performed, the majority of them in France, Germany, and Belgium. As a result of the meager knowledge of pelvimetry at that time and consequent bad selection of cases, along with the lack of surgical cleanliness, the results were not as brilliant as had been expected, and the operation gradually lost favor. The decline continued until the year 1841. From that time to 1858 there were only eleven operations altogether, and from July 25, 1858, to February 14, 1865, not a single one can be found recorded. The next operation was performed by Prof. Cesare Belluzzi, of Bologna, who had been very successful in delivering children through narrow pelves by induced labor. He was very unfortunate, as the woman had tuberculosis and died of tuberculous pneumonia on the twelfth day. The conjugata vera in this case was 7.8 centimeters. His next operation was performed on a patient having a conjugata vera of 7.4 cm., and this one died on the sixth day, of sepsis. The operation was revived and its technique very much improved by Prof. Morisani, of Naples

He first operated upon a living woman, on January 5, 1866, and was fortunate in saving both mother and child. This result encouraged him to persevere with the method, and in 1881 he reported to the International Medical Congress 50 operations with 40 recoveries. In 1886 he reported a number of cases operated upon by less experienced operators, and showed results not so favorable, 8 women and 5 children having been lost in 18 operations. This rather unfavorable report, coupled with the reports of remarkable results from the Säger¹ Cesarean section, only stimulated those who advocated and had faith in pubic section, to more rigid measures to secure the women and children against death. The results of their management are shown by the fact that from January 1, 1886, to the same time in 1892, 15 operators delivered 44 women, 6 of whom endured two operations, each with entire success, and 39 of the 44 children were saved. In this country Dr. Robert P. Harris² was the first to agitate the subject. He prepared an exhaustive paper, entitled, the "Remarkable Results of Antiseptic Symphyseotomy," which he read before the American Gynecological Society in 1892. He concluded with the following: "Here we have an operation characterized by Baudelocque as murderous and unphilosophical, converted by antisepsis into a safe surgical measure and without even the dreadful lameness that was once urged against it, the symphysis being readily made to unite firmly under proper fixation of the pelvis." Continuing, he says that it is certainly a simple substitute for craniotomy and one that ought to be tried without prejudice in the near future. Shortly after this, in the same year, Jewett³ performed the first operation in America, and three days later, Hirst,⁴ of Philadelphia, performed the second. Since that time it has been performed by various operators in this country and has been the subject of much discussion.

Report of Cases.—CASE I.—April 1, 1898. C. J. C., age 17; primipara. Previous history of no interest. History of pregnancy normal, except for last two months locomotion was somewhat impaired on account of looseness of joints. Physical examination: height, 4 ft. 9 in. Evidences of rickets marked; prominent forehead; rickety rosary; pendulous abdomen; bowed tibia. Pelvic measurements: Interspinous, 20 cm.; intercrystal, 22.5 cm.; intertrochanteric, 27 cm.; Baudelocque's, 16.5 cm.; diagonal conjugate, 8.6 cm.; true conjugate, 7 cm.

Diagnosis: Generally contracted flat rachitic pelvis. After labor had continued twenty hours, axis traction forceps was applied and several strong tractions made with no result. After this a consultation was held and symphyseotomy was decided upon. After preparation of the patient, the operation was performed, modified from the French method. With a separation of 7 cm. of the pubic bones, delivery was effected with great difficulty with the forceps and a dead child was the result. Immediately after the operation the patient was put in a plaster cast, which extended from the iliac crests to the trochanters. This cast soon became soiled with feces and urine and for this reason and because of the discomfort to the patient, it was removed and a surcingle applied. It is almost needless to say that after all the delay and many examinations the patient was infected. A culture from the uterus showed a pure growth of the streptococcus. She had a slow and tedious convalescence, but recovered entirely, and in three months was able to go to work. There was no movement at the joint, and since her recovery the woman has been as useful as before. Child dead. Head measurements: Occipito-mental, 14 cm.; occipito-frontal, 11.6 cm.; suboccipito-bregmatic, 10.2 cm.; biparietal, 9.4 cm.; circumference, 35.5 cm. As will be seen by an analysis of the above case, several mistakes were made. In the first place, the disproportion between the head and the pelvis was too great for symphyseotomy. Cesarean section should have been the operation of election. In the second place there was too much traction with the forceps, and entirely too much time was lost from that time until the operation, even had it been indicated.

CASE II.—October 21, 1899. A. B. C., age 18; primipara. Previous history of no interest. History of pregnancy normal. Physical examination: Height, 4 ft. 11 in.; typical signs of rachitis. Pelvic measurements: Interspinous, 26 cm.; intercrystal, 26.5 cm.; intertrochanteric, 31 cm.; Baude-locque's, 20 cm.; diagonal conjugate, 9 cm.; estimated true conjugate, 7.5 to 7 cm.; circumference, 87 cm.; height of symphysis, 5 cm.; between ischial tuberosities, 7.5 cm. Diagnosis: Flat rachitic pelvis. After having been in labor fourteen hours, the head did not engage in the pelvis and symphyseotomy was decided upon. Method of operation same as in Case I. Pubic bones separated 6.5 cm. Delivery by internal podalic version,

followed by immediate extraction. Patient was immediately placed in a swing made of an ordinary bed sheet, attached to a rope, which was passed through a pulley fastened to the ceiling. The patient swung in this sheet, which could be raised and lowered at will. Pillows were placed under the shoulders and legs, the hips being the only part not touching below. The sheet came into direct contact with the buttocks and soon became soiled, which necessitated changing it very often. In order to do this and prevent loosening the pubic joint, an assistant was required to stand on the foot of the bed, grasp the two feet at the ankles, rotate the thighs inward, and lift the patient up. In this way the sheet could be changed, but only with considerable discomfort to the patient and assistant. In order to remedy this defect in the swing, I had made a heavy rubber basin, large enough to fit under the hips, with a fairly large spout running off below. With this basin under the hips, the patient being then placed in the swing, the urine and feces could be passed, the vulva bathed, etc., all passing through the tube into a receptacle under the bed. The basin was kept clean by flushing thoroughly with a bichloride solution whenever necessary. By this means the patient remains in the same position all the time, is kept perfectly clean and comfortable, and altogether the method has proven very satisfactory. This patient had a mild infection (*staphylococcus aureus*), but in six weeks was well and in two months able to return to her usual daily life. Child was slightly asphyxiated, but was easily resuscitated. Weight, 2,880 grams. Head measurements: Occipito-mental, 13 cm.; occipito-frontal, 10.2 cm.; suboccipitobregmatic, 8.8 cm.; biparietal, 8.6 cm.; bitemporal, 7 cm.; circumference, 34 cm. Child thrived and left the hospital in good condition.

CASE III.—July 25, 1901. Out-Patient Department. S. F. C., age 19; primipara. Previous history of no interest. Present pregnancy normal; patient refused to go to the Hospital, and having been in labor for thirty hours with no progress, immediate delivery was indicated. Physical examination: Height, 5 ft. 4 in.; weight, 120 pounds. Pelvic measurements: Interspinous, 21.2 cm.; intercrystal, 22.2 cm.; intertrochanteric, 26 cm.; Baudelocque's, 16 cm.; diagonal conjugate, 9.5 cm.; true conjugate, 7.5-8. cm. Diagnosis: Generally contracted flat rachitic pelvis. Head not engaged in pelvis, L. O. I. A.

After anesthesia, an attempt was made to force the head into the pelvis, manually, but unsuccessfully. Symphyseotomy was decided upon and the operation performed in the same way as in Cases I and II, delivery being effected with comparative ease by high forceps operation. Patient was placed in the swing as in previous case. Puerperium complicated by a slight sapremia, but culture from uterus proved negative. Removed from swing on twenty-fourth day. In six weeks patient was doing her usual housework. Child was asphyxiated, but was easily revived and was in good condition when the students paid their regular evening visit. On the following morning it was found dead by the student. Both the patient and her sister, who was taking care of her, denied any knowledge of it, but the circumstances were suspicious of smothering. Weight, 2,400 grams. Head measurements: Occipito-mental, 12.7 cm.; occipito-frontal, 11 cm.; suboccipito-bregmatic, 8.5 cm.; biparietal, 8.5 cm.; bitemporal, 7.3 cm.; circumference, 36 cm. It must be taken into consideration that this patient was in the out-door department and was examined frequently by the students in attendance before the operation was performed, and the surroundings were very unfavorable. The operation was performed with the assistance of one of the resident physicians, who administered the anesthetic, and two students.

CASE IV.—June 8, 1903. M. B. C., age 17; primipara. Previous history uninteresting. History of pregnancy normal. Physical examination: Pelvic measurements: Interspinous, 24 cm.; intercrystal, 26.5 cm.; intertrochanteric, 30 cm.; Baudelocque's, 17 cm.; diagonal conjugate, 11.5 cm.; true conjugate, 9.5 cm. After labor had been in progress for a considerable length of time and the head had not engaged, an attempt was made, under anesthesia, to force it into the pelvis, but without result. Symphyseotomy was done as in other cases; pubic bones separated 7 cm. Delivered by high forceps, operation incision closed by catgut, two deep and one superficial sutures. Patient placed in the swing. Puerperium complicated by slight rise of temperature, but culture from uterus was negative. Removed from the swing on the twenty-third day; discharged from the hospital on the fortieth day, in good condition. Has been doing her usual work ever since. Child: Weight, 3,608 grams. Slightly asphyxiated, but easily revived.

Head measurements: Occipito-mental, 15.3 cm.; occipito-frontal, 12.4 cm.; suboccipito-bregmatic, 11.2 cm.; biparietal, 10.2 cm.; bitemporal, 8.5 cm.; circumference, 38 cm. Discharged in good condition.

CASE V.—February 26, 1905. E. C. M., age 19; primipara. Previous history of no interest. History of pregnancy normal. Physical examination: Well developed woman. No signs of any disease. Pelvic measurements: Interspinous, 23 cm.; intercrystal, 25 cm.; intertrochanteric, 31 cm.; Baudelocque's, 19.5 cm.; diagonal conjugate, 9.5 cm.; estimated true conjugate, 8 cm. or less. Diagnosis: Generally contracted pelvis. Palpation of the abdomen revealed a fetus of probably above the average size, presenting vertex, occiput to the right and posterior, head not engaged. Heart-beat heard in right lower uterine quadrant, 144 to the minute. Labor began at 2 P.M., February 25, and continued with slight force and some irregularity until 1 A.M. of the 26th. Some nervousness, for which morphia gr. $\frac{1}{4}$ was given, following which she slept for several hours. Upon awakening the pains began again and continued until 10 A.M., when palpation of the abdomen revealed the fact that the uterus was becoming tetanically contracted, heart-beat slower. For these reasons it was thought advisable to interfere. Patient was anesthetized with chloroform and examined, and after a careful comparison between the head and pelvis and an unsuccessful attempt to force the head into the brim, symphyseotomy was decided upon. Operation performed as above; separation of pubic bones 7 cm. Delivery effected with comparative ease by internal podalic version and immediate extraction. After-treatment same as above. Puerperium complicated by slight rise of temperature. Culture from uterus negative. Highest temperature, 100.4° F. Patient discharged at end of sixth week, in good condition. There was very slight motion at the pubes, but this did not seem to interfere at all with the patient's usefulness. She went immediately to housework, and performed the regular duties of such service from that time on. Child: Sex, male; degree of maturity, 40 weeks. Slightly asphyxiated, but revived after slapping. Cranial bones well developed, sutures closed and fontanelle very small. Weight, 7 lbs., 1 oz.; length, 48.5 cm.; vertex to coccyx, 32.5 cm. Circumferences: Shoulders, 37.5 cm.; occipito-mental, 39 cm.; suboccipito-bregmatic, 31 cm.

Diameters: Biparietal, 9 cm.; suboccipito-bregmatic, 9.5 cm.; occipito-mental, 14.5 cm. Child thrived and was discharged with its mother, in good condition.

In analyzing the above cases, we find that in Case I bad judgment was used. The operation was not indicated and there were so many examinations and so much manipulation that it is no wonder the patient was infected. The condition of the child was not good when the operation was begun, and when we add to that the difficulty encountered in the delivery, the fact that it was stillborn is not surprising. In Case II the conditions were such that after the separation of pubic bones, there was no difficulty in the delivery, and the operation was performed in good time, so that as far as the child was concerned the result was satisfactory. The patient was one from the public wards, and being an interesting case was examined quite frequently by the resident staff and students, naturally rendering the liability to sepsis greater than in a private case. Case III was in the hospital some time before confinement, consequently the contraction of the pelvis was recognized and the order given to make no vaginal examinations during labor until absolutely necessary. The patient was watched carefully, and when it was found that nature could not effect the delivery, and efforts at artificial engagement were unsuccessful, the operation was performed when everything was clean and mother and child were in good condition. The result was very satisfactory to both. Case IV was seen at a time when interference was absolutely necessary in the interest of the child. She was in a filthy hovel, very small close room, and nothing to work with except what is usually sent out in the student's satchel. Even under these conditions, the result was extremely satisfactory for the mother, and we have reason to believe that the child was smothered. At any rate, taking into consideration the ease with which it was delivered and what good condition it was in when last seen, one could hardly ascribe its death to the operation. Case V, like Case III, was in the hospital early enough to recognize the conditions and be on the lookout for complications. The result in both was extremely satisfactory.

Effects Upon the Size of the Pelvis.—The gain of space in the pelvis after opening the pubic bones, depends upon the mobility of the sacroiliac joint. Experiments on the cadaver show that the anterior sacroiliac ligaments rupture at different

degrees of pubic separation, ranging from 4 to 8 cm. In pelves of puerperal women a separation of 8 cm. is possible without injury to the sacroiliac joint. Seven centimeters was as much as was necessary in any of the above cases, and from my experience in these, I should not be disposed to cause a greater separation. Wehle⁵ called attention to the fact that when the pubic bones are separated, the sacroiliac joints rotate upon an oblique line running from above downward and from without inward, and that in consequence the ends of the pubic bones move downward as well as outward when the joint is opened. This descent of the pubic bones adds materially to the amount of space gained when these bones are separated. It has been estimated that with an interpubic separation of 6 cm. (2 2-5 inches) the true conjugate gains 1.2 cm. ($\frac{1}{2}$ inch), the transverse diameter, 1.9 cm. ($\frac{3}{4}$ inch), and the oblique diameters, 2.5 cm. (1 inch). With the separation that occurred in these cases, namely, 7 cm., the gain in the true conjugate is 1.5 cm. (3-5 inch). It must be borne in mind, however, that this does not represent the entire gain after the bones are separated, for when the head descends the anterior parietal boss projects into the opening about 1 cm., making in all a gain of 2.5 cm.

Low Limit for the Operation.—Arguing from the above facts and taking for granted that the fetal head is normal in size (*i.e.*, 9.5 cm. biparietal diameter), and allowing 1 cm. for moulding and pressure of the head, the low limit for the operation should be a pelvis having a true conjugate of 6.5 cm. But if we were to apply this rule in practice, I am inclined to the opinion that the results would not be very gratifying. In fact, I believe the average limit of 7 cm. for the true conjugate is too low, and that this measurement should be an *absolute*, rather than a *relative* indication for Cesarean section, always taking for granted that the head is normal in size.

Difficulties in Deciding Upon an Operation.—It is evident that the safe choice of any procedure must depend upon an accurate estimate of the pelvis and of the fetal head and this is possible only for an expert, well trained in pelvimetry and abdominal palpation, and even then only within certain limits. Exact and definite figures in these cases are next to impossible to obtain and are misleading. Given a pelvis of certain measurements, except, of course, in what might be termed the "absolute

variety," it is in many cases impossible to say what operation will be indicated or what the outcome will be. The uncertain quantities, in addition to the pelvis, are the size of the fetal head and the degree of moulding of which it is capable. While we can form some idea of these conditions, no definite conclusion can be reached. The ideal method of dealing with these cases is, after a careful examination, to decide upon one method of procedure and carry it out rather than to attempt several. Unfortunately, this is not always possible, as the kind of pelvis we are most frequently called upon to treat in this part of the United States, is that having a true conjugate ranging between 7.5 and 9 cm. Anyone who has practiced obstetrics to any extent, has seen spontaneous deliveries in these very cases, although as a rule, this occurs only in the case of a small fetus or a very soft head. These cases should be allowed to go into labor and be watched carefully, refraining from making vaginal examinations, so that if an operation becomes necessary it can be performed upon a clean woman. If, after a reasonable length of time, with good flexion and the left anterior position with good strong labor pains, the head does not engage, it generally means that the disproportion is too great. Then must we make a very careful comparison of the head and the pelvis, and this is better accomplished under an anesthetic. The patient having been anesthetized, one hand is introduced into the vagina, the other applied over the lower abdomen, and an attempt is made to force the head into the pelvis. If, by this means, the head can be made to engage, delivery through the natural channel is, of course, possible. That it is justifiable to apply the forceps and attempt, by traction, to force the head into the pelvis, under some circumstances may be admitted; but this extra manipulation undoubtedly increases the danger for both mother and child, and therefore it should seldom be done.

Indications.—In certain cases, where Cesarean section is contraindicated, or for certain reasons might not be considered safe, symphyseotomy might be the means of saving the life of the child. Such an example would occur in the case of a pelvis contracted at the outlet (funnel-shaped pelvis), where the head had been forced into and fixed tightly in the brim, but could not be forced through. In such a case Cesarean section

would be contraindicated, as a dead child would usually be the result, whereas symphyseotomy would usually give a good result to both mother and child. Also in the case of an impacted mentoposterior variety of face presentation, where flexion of the head or podalic version was impossible, symphyseotomy might be performed. In case of limited assistants and facilities and unfavorable surroundings, symphyseotomy will undoubtedly give better results than Cesarean section. Case III of the above series was of that kind. The patient refused absolutely to be removed to the hospital, and immediate action was necessary in the interest of the child. Needless to say, Cesarean section was out of the question, whereas symphyseotomy was performed with ease and with good result. Under these very conditions children are destroyed that might be saved by pubic section. Then again, it is undoubtedly true that it requires greater skill and practice to perform Cesarean section than symphyseotomy. Many men would very properly hesitate before performing an operation of such magnitude, whereas comparatively few, if they realized the benefits of a properly selected symphyseotomy, would hesitate to undertake that procedure. One who is not thoroughly trained in aseptic technique should expect a better result following pubic than abdominal section, for while infection is quite a frequent occurrence after the former, it is usually of a mild type and ultimately terminates in recovery, whereas in the latter it is a very dangerous complication, and when it does occur often terminates fatally in a short time. For these reasons, physicians in the country, who have not the conveniences of hospitals or trained assistants, might very readily undertake the performance of a symphyseotomy, with every hope of saving both mother and child. Under these conditions it would certainly be hazardous to perform a Cesarean section, and, as experience has shown, very few will undertake it. In conclusion I would say that if a case is under consideration and it has been definitely decided that a living child cannot be delivered *per vias naturales*, Cesarean section should be the operation of election, believing that in the long run the best results to both mother and child can be obtained from that operation. In the exceptional cases mentioned above, symphyseotomy with careful after-treatment will undoubtedly give good results. The operation of pubiotomy, revived recently, promises better results than symphyseotomy,

but having had no experience with it, I am unable to speak advisedly.

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A REVIEW OF FOURTEEN CESAREAN SECTIONS SUCCESSFULLY PERFORMED.*

BY

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(With one illustration)

TWELVE of these cases have been already reported at length. The thirteenth case was operated on at the Medico-Chirurgical Maternity, October 9, 1906; and the fourteenth, a private case, was operated upon, February 15, 1906. It is the desire of the writer, in this paper, to review briefly his cases already reported; and to add to their number cases thirteen and fourteen, recently operated on.

CASE I. *Flat, Rachitic Pelvis with Uterine Myomata*.¹—Mrs. M., a negress, was admitted to the Philadelphia Lying-in Charity, May 21, 1896. She was a primipara, and had been in labor two days. She was septic and exhausted. We found that she was pregnant at term, and that there existed a com-

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plication, a myomatous condition of the uterus. Several tumors could be easily felt through the wall of the abdomen—one decidedly pedunculated. The fetal heart could not be heard. A foul discharge issued from the vagina. Careful measurements of the pelvis developed another phase of the case. We were not only dealing with a case of impossible labor, caused by a uterine tumor, but also with a flat, rachitic pelvis. Celiohysterectomy was immediately performed. Before opening the uterus, a quantity of foul-smelling gas escaped. The child was dead. In spite of her septic condition, the mother made a good recovery.

CASE II. *Scolio-rachitic Pelvis*.²—A second elective Cesarean section in the same individual. Mrs. C., aged 30 years, was admitted to the Philadelphia Lying-in Charity, August, 1897. She was well advanced in the last month of gestation. In 1882, Dr. C. P. Noble had delivered her by the elective Cesarean section; August 12, 1897,³ the second elective celiohysterotomy was performed. The abdominal incision was made at the side of the old scar and omental adhesions were loosened, when it was found that the uterus and abdominal wall were firmly united at the lower angle of the old incision. The uterus showed no evidence of the first incision. The silk sutures used could not be found. Result: Baby alive, mother made a good recovery.

CASE III. *Coxalgic Pelvis*.—Mrs. F. was admitted to the Medico-Chirurgical Maternity, October, 1897. She was an American, aged 24 years; and a secundipara, in the last month of gestation. At five years of age, she had developed hip-joint disease, which finally resulted in ankylosis. She went about on crutches until her twelfth year. In June, 1896, she was delivered of her first child, by craniotomy, after a long labor. Celiohysterotomy was performed on October 16, 1897, after a test of labor for ten hours. Result: Baby healthy; mother recovered.

CASE IV. *Generally Contracted Pelvis*.⁵—Mrs. K., a white multipara, was admitted to the Medico-Chirurgical Maternity, October 3, 1896. She had had six pregnancies. The first, second, and third had ended in craniotomy; the fourth, fifth, and sixth had been induced prematurely, at about the two hundred and fiftieth day, without success. She was pregnant for the seventh time, and well advanced in the last month. The

elective celiohysterotomy was performed October 6, 1898. Result: Baby alive; mother nicely recovered.

CASE V. *Scolio-rachitic Pelvis*.⁶—A third Cesarean section on the same individual.

Mrs. C. (Case II) was admitted to the Medico-Chirurgical Maternity, February 13, 1900, already fourteen hours in labor. Three years previously she had been delivered a second time by Cesarean section. A third celiohysterotomy was performed, February 13, 1900. The incision was made this time over the old scar. Extensive omental and uterine adhesions were found, necessitating a transverse fundal cut through the uterine wall. Result: Baby alive; mother made a rapid recovery.

CASE VI. *Obliquely Contracted Pelvis*.⁷—Mrs. B., aged thirty-seven years, a third time pregnant, was admitted to the Philadelphia Lying-in Charity, February 28, 1900. Her first labor had been long, she having finally been delivered of a dead baby by forceps. The second labor had ended in a craniotomy. As the result of these two instrumental deliveries, the soft parts were badly torn, demanding, two years later, the removal of the left ovary, a trachelorrhaphy, and a ventrosuspension.

After a test of labor (fourteen hours), celiohysterotomy was performed. An interesting point in the operation was the effect of pregnancy upon the suspension of the uterus. Fortunately, it was not firmly attached; else we might have had another cause for obstruction. The growing uterus had left its point of attachment, and a cord-like band, six inches in length, was found extending from the fundus, over the anterior wall of the uterus, to the point of attachment. Result: Baby alive; mother made an easy recovery.

CASE VII. *Flat, Rachitic Pelvis*.⁸—Mrs. R., aged 26 years, white, was admitted to the Philadelphia Lying-in Charity, August 28, 1900. She was near term. She had had three labors, ending disastrously to the baby. The first had been a high-forceps delivery. The second and third had ended in craniotomy. Elective celiohysterotomy was performed. An attempt was made to sterilize the patient by removing a section of each tube, and then ligating both ends. It has, so far, been a success. Result: Baby alive; mother recovered.

CASE VIII. *Generally Contracted Pelvis*.⁹—Mrs. B., aged 27 years, a negress, was admitted to the Philadelphia Lying-in

Charity, February 8, 1901, in labor eleven hours. She had had three hard labors, with three dead babies. The forceps was applied, and judicious traction made; but, failing to advance the head, the patient was prepared for section. Celiohysterotomy was rapidly performed, and a living baby delivered. The operation was of no special interest, other than as regards the fact that we cut down upon the placental site. In two or three other cases, the placenta occupied the same position, namely, the anterior wall of the uterus. Result: Baby alive; mother recovered.

CASE IX. *Generally Contracted Pelvis*.¹⁰—A second Cesarean section in the same individual. Mrs. B. (Case VIII) returned to the Philadelphia Lying-in Charity, February 2, 1903, already actively in labor. Again, the following measurements were taken: Interspinous measurement, 23 cm.; intercrystal, 25 cm.; external conjugate, 15 cm.; diagonal conjugate, 9.5 cm.; true conjugate, 8 cm. Having the previous history to guide us, and the labor again being obstructed, celiohysterotomy was again performed. Omental adhesions were found, and the uterus was attached to the abdominal wall. The uterus was freed, and a portion of omentum removed. The Fallopian tubes were resected, hoping to sterilize the patient. Result: Baby at term and alive; mother recovered.

CASE X. *Generally Contracted, Rachitic Pelvis*.¹¹—Mrs. S., a negress and a primipara, aged 17 years, was admitted to the Philadelphia Lying-in Charity, April 15, 1903. The following measurements of the pelvis were made: Interspinous measurement, 25 cm.; intercrystal, 25 cm.; external conjugate, 17 cm.; true conjugate, 7.5 cm. She went into labor on the evening of May 24, but made little progress, the head remaining high and movable above the pelvic brim. At 5 A.M., she developed an eclamptic convulsion. Celiohysterotomy was performed at 12.30 P.M., May 25. The baby was asphyxiated when delivered, but soon began to breathe. Albuminuria existed during the first week of the puerperium, and then disappeared. Result: Baby alive; mother recovered.

CASE XI. *Rachitic Pelvis*.¹²—Mrs. S., a white multipara, aged thirty years, was admitted to the Philadelphia Lying-in Charity, July 5, 1903. She had had her last menstrual period on October 20, 1902. In 1899, she had been delivered by craniotomy, having been badly torn and having become septic

These injuries had left her with a rectovaginal fistula. In 1902 she had miscarried at seven months. The pelvic measurements were as follows: Interspinous, 18 cm.; intercrystal, 18 cm.; external conjugate, 15.5 cm.; internal conjugate, 7.5 cm. The head presented and was bulging well over the pelvic brim. There was no attempt at engagement. With the history of the previous labor to guide us, and the patient being anxious for a living child, an elective celiohysterotomy was performed on July 28. In this case, a wedge-shaped incision was made at the cornua of the uterus, and the wound closed with silk sutures, thereby resecting the tubes and closing the uterine ends, after a method suggested by Williams. Result: Baby alive; weight, seven pounds and a half; mother and infant left the hospital in four weeks, fully recovered.

CASE XII. *Rachitic Pelvis*.¹³—Mrs. —, a negress and a primipara, aged 18 years, an American, was admitted to the Medico-Chirurgical Hospital, October 3, 1903. Her last menstrual period had been on February 22, 1903; and from her own calculations she expected her confinement on November 29. The patient showed marked evidences of congenital rachitis, and gave a clear history of the same. She had the characteristic general bony and pelvic deformities. The following measurements of the pelvis were made: Interspinous, 22 cm.; intercrystal, 22 cm.; external conjugate, 16 cm.; diagonal conjugate, 7.5 cm.; true conjugate, 6 cm. The elective Cesarean section was performed for the absolute indication. The patient made an uneventful recovery, and left the hospital December 15, 1903, in good condition.

CASE XIII. *Generally Contracted Pelvis, with Exostosis Over the Promontory of the Sacrum*.—Mrs. C., a secundipara, 24 years old, born in the United States, was admitted to the Medico-Chirurgical Maternity, on September 23, in the last month of gestation. On June 12, 1902, she had been delivered of her first child, the labor, which was long, having been complicated by eclampsia, and having ended in the birth of a dead child. She had a markedly contracted pelvis. The following measurements were made: Interspinous, 23 cm.; intercrystal, 26 cm.; external conjugate, 17 cm.; true conjugate, 7.5 cm. On internal examination, the head was found presenting. It was very high, standing out very prominently over the pelvic arch. The patient went into labor October 8, during the night. The

presenting part did not advance. Taking into consideration the history of her first labor, which had ended disastrously to the child, and as the degree of contraction seemed to contraindicate high forceps or version, on October 9, after a twelve hours' labor, Cesarean section was decided upon as the best solution of the problem. Celiohysterotomy was done, and the child rapidly extracted. The mother made a good recovery, without any complications, the temperature never reaching 100° F. The infant's weight at birth was seven pounds, ten ounces. A point of interest in the operation was the discovery of an exostosis projecting from the promontory of the sacrum, which added materially to the contraction of the conjugate.

CASE XIV. *Labor Obstructed by Anterior Fixation of the Uterus.*—Mrs. M., aged 33 years, a multipara, born in the United States, was seen by the writer in consultation on February 15, 1906. Her previous history is as follows:

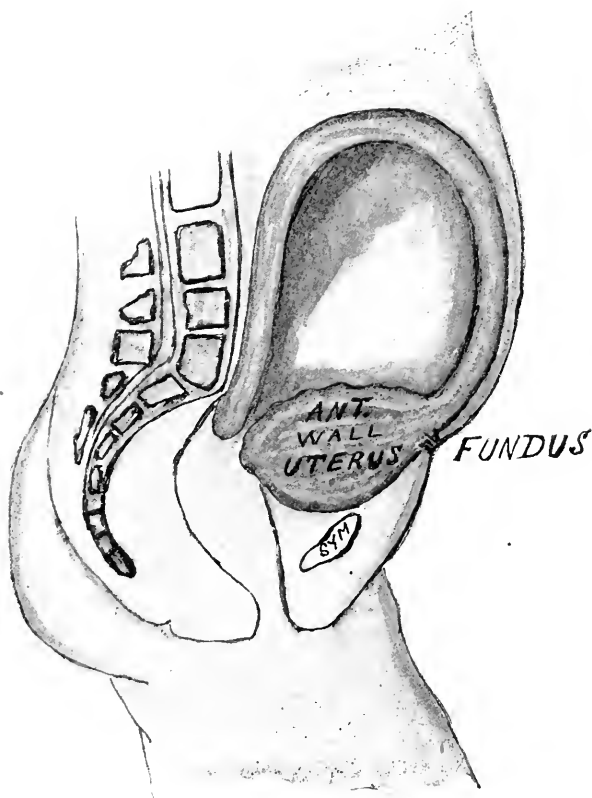
Previous History.—Her first-born child is 10 years old. This labor was not difficult. Two years after this child's birth, and eight years ago, for the relief of retrodisplacement of the uterus, it was fixed to the anterior abdominal wall. A stitch-hole abscess prolonged the convalescence. Three years after this operation, her second child was born, after a difficult labor which was ended with forceps. The child was born alive.

Present History.—The patient is pregnant at term, and already twenty hours in labor. She states that she has had much discomfort throughout most of the pregnancy, chiefly a dragging sensation and pain in the ovarian region. The membranes ruptured soon after the onset of labor. The pains at first were strong and intermittent, but now are less severe and almost continuous.

Examination.—The uterus, the size of a pregnancy at term, is irregular in shape, suggesting a transverse presentation. A marked depression is seen on the abdomen, at the place of attachment of the uterus to the abdominal wall. The pelvis is normal in size and shape. The vagina is dilated, and the cavity of the pelvis empty. High up, and near the sacrum, is felt with difficulty the cervix, which, even after a test of 20 hours' labor, is not dilated. A large mass, the thickened anterior wall of the uterus, is felt at the brim of the pelvis and completely occluding the inlet. With difficulty, the finger is inserted into the cervix; and the presenting part cannot

be positively diagnosed. The child is in an imperfect oblique position, with the head to the right. The fetal heart is heard, but not distinctly.

Operation.—As the patient had been a long time in labor, with some of the early symptoms of obstruction, she was immediately prepared for operative interference. Anticipating



Case XIV.

section, several hours elapsed before ether was given her. Even with the relaxing effect of anesthesia, the cervix remained high, and the obstructing tumor could not be displaced. Craniotomy could not have been performed. Section was the only method of delivery possible.

Upon opening the abdominal cavity, the uterus was found

bound down in front. It was drawn into the wound, a longitudinal incision was made, and the child was rapidly extracted. Now the tumor (the hypertrophied anterior wall of the uterus) could be distinctly felt as a spherical mass, projecting into the cavity of the uterus.

After liberating the uterus from its point of attachment to the anterior abdominal wall, the incision, now on the posterior wall of the uterus, was closed. The convalescence was uneventful. The mother and child are doing well.

In Case I the patient was septic and the pelvis was rachitic. In addition, she had a large fibroid on the pelvis. In this case, operated upon in 1896, hysterectomy was performed. In the thirteen cases following, the patients were in fairly good condition and the simpler operation, hysterotomy, was done.

In the first case, the child had been dead some time before the operation. With this exception, the list is without maternal or fetal mortality.

In Case II Mrs. C. has three Cesarean-born children living and healthy, their ages being, respectively, 14, 9, and 6 years. The mother is in good health.

In Case III coxalgia occasioned the pelvic deformity. This woman's first labor was terminated by craniotomy.

In Case IV the patient had had six dead infants. Three times had labor been prematurely induced, without success.

In Case VIII the patient lost her first Cesarean-born infant in its second year. By repeating the operation she now has a living child.

In Case XIV the obstruction to labor was the thickened anterior wall of the uterus. In all the other cases a pelvic deformity existed.

Three of the patients were primiparæ. Two of these had the test of labor. In the third case, with a rachitic pelvis of 6 cm. in the true conjugate, the elective operation was performed.

In the majority of the cases, only the relative indication for section existed. The guides to the solution of the problems were, first, the history of a previous labor; and second, a test of labor.

Cesarean section is frequently performed to-day (some would say, too frequently). The results, in the hands of the com-

petent operator, are so successful that, in conclusion, I shall say only a word in regard to one disputed question in the treatment of pelvic deformity, namely: the induction of premature labor. This operation has its advocates and those that strongly oppose it. I shall take the liberty to draw upon a previous paper upon this subject, which covers my views:

"The induction of premature labor would be a wise procedure, were it possible to measure accurately the length of the period of gestation. I have never been able to satisfy myself that this is possible, and prefer to permit the patient to go to term.

Hirst,¹⁴ favoring the induction of labor, says: "If the conjugate diameter measures as low as 9.5 cm., it is a safe plan to induce labor four weeks before the expected term of pregnancy."

Norris¹⁵ states that he is inclined to feel that Cesarean section is too frequently resorted to; he reports twenty-nine cases of induced labor, with no maternal mortality, and only 10 per cent. of fetal mortality. He would resort to induction of labor only in pelves of minor degrees of contraction.

Reynolds, Williams, and Edgar, on the other hand, prefer to permit the patient to go to term, giving her the trial of labor, and then instituting the method of delivery most expedient.

The high fetal mortality and the difficulty of estimating the length of gestation have led many to follow the expectant plan. Kleinwochter, after an exhaustive study of the subject, concludes that 78.3 per cent. of the children are born alive; but that many of them die soon after birth, and only 60.4 per cent. leave the hospital in good condition.

Is the induction of premature labor justifiable, admitting the difficulty of estimating the length of gestation?

My experience has not been as satisfactory as that of those who advocate this operation. Even with a clear menstrual history, we must admit the fact that the patient may have conceived at any time before the next menstrual epoch, a period covering three weeks. Then, again, in some cases it is impossible to get the menstrual history. These cases must, of course, be excluded from this method of treatment. Moreover, the methods of inducing labor are not always satisfactory. The Simpson method, the introduction of one or two bougies into the uterus, does not always bring on labor promptly; the bougies

sometimes rupture the membrane, and in some cases this necessitates hydrostatic methods of dilatation. I, therefore, feel that I can best serve my patient by permitting her to go to term.

How frequently have we all prepared for a difficult forceps operation—version, symphyseotomy, and even Cesarean section—and then had the labor end spontaneously. Admitting this fact, how can one, four weeks before the end of gestation, feel sure that the induction of premature labor is indicated? Each case must be a study in itself. In the primipara, the course to pursue will be more intricate than in the multipara; for in the latter cases one has the history of the previous labor to guide one. In the majority of cases, the forceps will suffice. Failing in this method, version or pubiotomy is indicated, or Cesarean section in the exceptional cases.

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SURGICAL TREATMENT OF PUERPERAL INFECTION.

BY

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ALTHOUGH it is designed to limit this paper to the surgical treatment of puerperal sepsis, it will not be possible to entirely ignore those milder forms of the disease in which the site of infection can be reached readily by finger, douche, or curette and which yield readily to inunction with Credé's ointment, the intravenous injection of collargol or the administration of the various serums. This is particularly true because the low rate of mortality which has been given by many authorities from methods of treatment other than the purely operative makes one hesitate to employ measures which may enhance the danger to the patient. For instance: Williams¹ and Kronig² had four per cent. mortality from nonoperative cases; Treub³ treated 724 nonoperative cases and lost 34, or 4.7 per cent. On the other hand, Fehling⁴ reports 367 cases from the Strasburg clinic with a mortality of 18 per cent., and Osterloh⁵ reports a mortality of 50 per cent. (98 cases in all) in the severe nonoperative cases in Dresden.

No one doubts, for a moment, the accuracy of the statements made by the first three authorities, but the difference between their results and those of Osterloh should give us some reason for refusing to accept them blindly. They are misleading to the general practitioner and give warrant to his prolongation of the treatment by the means already referred to, a line of treatment which in many cases leads to the losing of that auspicious moment when surgical treatment gives hopes of cure. No one doubts, further, that puerperal infection is one of the most dangerous conditions into which the human being can be thrown, or that there is a time—a moment, if one will—when the resources of surgery open up to the patient and the physician a prospect that does not always fulfil its alluring hopes, but at other times more than repays the risks which are taken.

The work done since the International Congress at Rome in

1902 has been full of good results and gives promise of still greater rewards.

The following statement will no doubt pass as the accepted position in regard to the symptomatology: that the disease is an acute infection produced by saprophytic germs, by the staphylococci, streptococcus, gonococcus or the bacillus coli communis, either singly or in combination; that these organisms find entrance into the genital tract through tears produced by manipulation or by the fetus in its progress through this tract or at the denuded placental site; that it is, at first, a local affection which spreads with greater or less rapidity into the surrounding parts and eventually into the general system; that it usually begins upon the third day post partum with an initial chill and malaise followed by fever, joint and head pains—in short, all the symptoms which precede or accompany the acute infections, and the characteristic symptoms of distention of the abdomen and sensitiveness to pressure and a more or less well-defined dullness in the lower part thereof; that, at times there is an offensive discharge from the uterus, but that this is not a necessary accompaniment of even the severest forms.

It may, further, be stated, that while the germs may remain at the site of the first invasion and produce simply a local infection—a wound fever in short—which yields readily in the majority of cases to local disinfection and mechanical removal of the germs, there are numerous cases in which they get into the parts immediately in or surrounding the uterus, and there set up endometritis, metritis, pelvic peritonitis, septic thrombosis of the veins, etc., and finally reach the general peritoneum and the general system with all the dangerous consequences of general peritonitis and septicemia.

Leopold⁶ has classified these results in four groups, and this classification may be adopted here as giving a working basis, not absolutely satisfactory, possibly, but still the best which has hitherto been submitted.

It is as follows:

“I. To the first group belong the cases of general peritonitis which have occurred from the passage of pus formers (principally streptococcus, staphylococci, gonococcus, bacterium coli) from the uterus to the peritoneum. In this form occur the poisoning of the blood, the swelling of the spleen, intestinal paralysis,

weakness of the heart and the rapid passage of the microorganisms to the serous membranes of other organs.

"II. To the second group of severe cases belong those in which the microorganisms find their way chiefly into the venous system, producing, thus, not only a serious inflammation of the uterus and the parametrium, but also a septic thrombosis either at the site of the placenta or by passing through this to the infection of the hypogastric, the crural, or internal spermatic veins.

"III. Third group includes those cases in which the disease becomes particularly localized in the endometrium and spreads from here to the adnexa of one side (endometritis, salpingitis, oophoritis purulenta puerperalis).

"The patient shows high fever, greatly altered systemic condition, a uterus swollen by inflammation and extremely sensitive, and on one side thereof a hard, painful mass in the infiltrated adnexa. This mass is the site of a circumscribed peritonitis which under certain circumstances may lead to a general peritonitis and death of the patient.

"IV. A fourth group embraces cases in which the symptoms point to the presence of multiple abscesses in the uterine muscle and to a pelvic peritonitis (metritis acuta puerperalis abscedens), parametritis posterior and pelvioperitonitis.

"V. In the fifth group must be included those cases in which, from the bruising of tumors that complicated the delivery, or the destruction of tissue at the time of labor, a resultant gangrene occurred, and this in time produced a fully developed or incipient peritonitis."

Diagnosis.—The differential diagnosis has an important bearing upon the question of surgical interference. It would be a most unfortunate mistake to operate under the supposition that puerperal infection existed, when in reality typhoid fever, pneumonia, or acute tuberculosis complicated parturition, but care should prevent such a mistake. But it would be just as great an error to suppose that one was dealing with any complicating condition when puerperal infection really was the cause of the symptoms. A careful attention to the symptoms already mentioned, particularly those which show involvement of peritoneum or the uterine adnexa, would prevent such an error except in the hands of the inexperienced or the careless.

While microorganisms are the recognized cause of puerperal

infection, it is not yet definitely settled that their presence or absence gives evidence which can be relied upon in the individual case, for streptococci, staphylococci, and possibly others are found in cases which run a normal course (Fehling⁷). Treub⁸ says: "Investigations made by myself, Petrauschky and M. A. Kline show that the bacteriological examination of the blood does not give an absolutely, but only a relatively certain criterion."

When the symptoms of beginning sepsis are observed in a patient, and the vaginal or particularly the post-partum uterine discharges show the presence of the germs already mentioned, there need be little doubt that one has to deal with puerperal sepsis. A point of great importance in the diagnosis is made by Leopold.⁹ He says: "If one should ask what is the most frequent cause of the venous form of puerperal fever, I should say that according to my experience, criminal abortion stands first, then comes placenta prævia, the deep-seated placenta with venous sinuses open for days, and thirdly that most dangerous of obstetric manipulations—the manual separation of the placenta." Is this not generally true?

Stress is laid upon these points for reasons which will appear later on. Reference should be made to another point in the differential diagnosis. I mean the presence or absence of microorganisms in the blood. We shall all agree that when septicemia has become well pronounced the germs are found in the blood current, but cases are on record in which all the signs and symptoms of puerperal infection were present and still the blood contained no germs. I have not, however, found a single case in the literature in which leukocytosis was not present. Potocki and Lacasse¹¹ say: "Prognosis is doubtful in presence of a leukocytosis of over 25,000 to 30,000, with over 80 per cent. polynuclears and decrease or disappearance of eosinophiles. Would reserve laparotomy with hysterectomy for severe cases in which eosinophiles are absent."

Treatment.—Recognizing, now, that while this disease is at first local and probably curable in the very earliest stage by the mechanical and antiseptic measures already referred to, there are many instances in which the case either comes too late into the hands of the obstetric surgeon or the favorable moment—the surgical moment, if one will—has been delayed by too prolonged an attempt at cure by the less radical means. This is

the crux of the whole matter: How long shall we wait before operating?

I. It may be assumed as beyond controversy that all cases under Group V (infection from bruising of tumors or tissues) should be operated upon as soon as the diagnosis has been decided upon. The fact that tumors complicated the pregnancy and interfered with the delivery, with the subsequent development of symptoms of sepsis, ought to be justification enough to warrant an effort at removal of those tumors. Even when the cases are believed to be inoperable, an exploratory incision would at most only hasten the inevitable result, and might lead to an amelioration of symptoms. Leopold reported such a case to the Congress at Rome in 1902. "On the third day post-partum there was developed a severe peritonitis with most threatening symptoms. These proceeded from a disintegrating carcinoma and a bruised uterus. The abdomen was opened at once, and the markedly hyperemic intestines and inflamed uterus were pushed to one side. In Douglas' pouch a degenerating mass was found. This was dried and drainage procured by perforating the vaginal vault. Normal salt solution was used for cleaning serous covering of uterus and intestines; the pelvic organs were put in as natural a position as possible, and the fundus uteri was attached to all the surrounding organs by serried sutures so as to cut off the carcinomatous mass. All symptoms quickly disappeared and in three weeks the patient was free of fever."

Schultze¹⁰ was the first to develop this operation and the credit is his.

II. In cases of retained placenta where all efforts at removal have proved ineffectual, no good object can be served by waiting since hysterectomy seems to be the only hope of saving the patient, especially if sepsis has occurred.

The following cases illustrate this point:

CASE I.—Sepsis sixteen days after labor. Tried to remove placenta by various methods without success. Hysterectomy. Recovery. (Sippel.¹²)

CASE II.—Abortion, fourth; fetus easily removed, but not placenta. Total vaginal hysterectomy, second day. Recovery. Feis.¹³ Uterus showed putrid endometritis; no perforation, but muscular coat bored through almost to serosa. Cocci found only at necrotic part, not in muscularis or vessels.

CASE III.—Primipara. Premature delivery (six months). Macerated fetus. Placenta immovable. Various methods tried for four days, then chills and fever. Laparotomy on seventh day. Recovery. (Kupferberg.¹⁴)

That form of puerperal sepsis in which the microorganisms have produced septic thrombosis (Group II, Leopold) in the veins is one of the most dangerous with which the surgeon has to deal. That it occurs frequently was shown by Trendelenburg¹⁵ who says: "Of 43 post mortem examinations made after puerperal sepsis, 21 showed thrombotic pyemia, and in four of these the lymph vessels were involved." To this surgeon¹⁵ is due the credit of first successfully removing such veins.

The influence of criminal abortion, placenta prævia, and the manual separation of the placenta in the production of this form of the disease has been mentioned. Their existence may help materially in making the diagnosis, and this diagnosis once established should be followed by immediate operation.

Bumm¹⁶ recently reported two cases. In one, after version there was a chill, another on the next day with high fever, markedly distended abdomen—in short, peritonitis. Pus containing streptococci, etc., was obtained by hypodermic puncture on third day, and then incision and drainage were done. There was immediate improvement, but a relapse occurred, and the woman, after Bumm's vacation which was possibly of several weeks' duration, still had chills and high fever, together with an infiltration in the right parametrium, which was due to a filling of the veins by septic material. These veins were tied off. Recovery. Bumm's second case was operated upon after the second chill. Chills ceased on fourth day. Recovery.

In these cases the veins were simply cut down upon and tied; they were not excised. In the discussion which followed the presentation of the cases Bumm said: "I believe when one operates from the abdominal cavity and would avoid a secondary peritonitis, one should not dissect too much about the veins."

CASE III.—Leopold.⁶ Primipara. Term; on third day chill and fever; twelfth day, incision for drainage; eighteenth day, laparotomy; purulent thrombotic veins incised. Death. Streptococci found.

CASE IV.—Haeckel.¹⁷ Mole removed May 28, 1905. June 21, chill; collargol injections valuable at first; then recurrence.

July 11, ligature of hypogastric and spermatic veins, both sides. Recovery.

A second case died of pneumonia.

In Group III of cases, those in which the symptoms point to a localization of the infective process to one side of the uterus (the adnexa), it would seem to be wise to wait. So often these inflammations, even when pus is present, seem to remain limited and the pus to become walled off from the peritoneal cavity that no harm can come from waiting for that result to take place. This is particularly true in cases of gonorrheal origin, as was demonstrated by Herman and Harris,¹⁸ who showed: "That of 18 cases collected from the literature, 13 were operated with two deaths, while of 5 which were not operated, all died. Of 21 cases, 11 were operated upon and 3 died; 10 not operated upon, 2 died." They state that the symptoms usually disappear in three days, that is, the threatening symptoms, leaving the results to be treated as they would be in nonpuerperal cases. While this waiting would seem to be the right course to pursue, it is nevertheless true that if the symptoms of infection continue to increase in severity and the danger of systemic invasion becomes more pronounced, no good can result from waiting, but operation should be carried out at once, with the hope that by removing the focus of infection the phagocytic power of the white corpuscles may take care of the systemic complications.

CASE I.—Primipara. Fifth to tenth day, fever and chill; pyosalpinx, right side. Laparotomy sixteenth day; salt solution. Recovery. Streptococci and gonococci (?) (Leopold.)

CASE II.—Primipara. Fourth day, fever. Under local douches improvement until twentieth day, then fever; abscess in gluteal mass, etc. Pyemic fever until forty-ninth day post partum. Laparotomy. Recovery. Syphilis and gonorrhea. (Leopold.⁶)

CASE III.—III-para. Fifth to eighth day fever with meteorism, dullness. Peritonitis. Laparotomy, eighth day, drainage and removal of adnexa. Death. (Leopold.⁶)

CASE IV.—VII-para. First day after normal (?) confinement, three chills with fever; third day, placental remains removed; ninth day, part of uterus, tube on right side, and right broad ligament removed through abdominal incision. Small pus cavity near pelvic bone evacuated. Recovery. (Boldt.²⁰)

CASE V.—Primipara. Normal delivery; third day, fever,

continued to fifteenth day, then prolonged chill; twenty-first day, removal of part of uterus, tube, adnexa, and broad ligament. Death. (Boldt.²¹)

A similar line of argument would seem to be proper for Group IV (multiple abscesses in uterine muscularis and consequent pelvic peritonitis). The differential diagnosis can hardly be made before operation, and the rules which govern the course of procedure in the other groups would have to be gone over in succession and the decision of an early or late operation would have to be deduced from such consideration.

Group IV, abscesses in uterine muscularis with pelvic peritonitis.

CASE I.—Primipara. Fifth day, fever; thirty-fifth day, opening of large abscess; fifty-seventh day, laparotomy. Recovery, one-hundred and fifteenth day. (Droese, quoted by Leopold.¹⁹)

CASE II.—Primipara. Two operations; one, for ascending puerperal endometritis and second for salpingitis. Uterine abscess. Drainage. Recovery. (Leopold.⁶)

CASE III.—Primipara. Fifth to ninth day, fever; twenty-ninth day, laparotomy. Recovery. (Leopold.⁶)

The first group (Leopold) may be made to include not only all the other forms of the disease under consideration, but also all other points of diagnosis. Its consideration brings up points which have not been dilated upon heretofore, and which are of paramount importance in the discussion of general peritonitis in the cause of puerperal infection. The points of diagnosis are: Meteorism which increases with greater or less intensity; dullness in the lower abdominal region, this also increasing at a rather rapid rate, and the various symptoms of systemic invasion. With these signs and symptoms will come the question as to whether operative procedure will probably result in good to the patient, or will increase the danger. There will also come the question when to operate.

At the risk of being considered prolix, I shall take from Leopold's⁶ article some cases for the purposes of diagnosis. The reason for doing this is that the symptoms which preceded operation, the findings at time of operation and the post-mortem evidences of the disease are given. Together they give as clear an idea of the conditions found and the symptoms which accompany these conditions as could be wished for.

CASE I.—*General Puerperal Peritonitis*.—Normal labor. Digital examination made. Multipara. On the fourth day, evening temperature, 37.6° ; pulse, 96. Nausea, some pain in abdomen, which was distended and tender. Fifth day, A.M. temperature, 37.3° ; pulse, 116. Abdomen markedly distended and sensitive. Absolute dullness both sides lower part of abdomen. Respiration quickened. Pulse small and rapid. Hiccough and facies Hippocratica. Placental remains hanging from uterus. These removed and uterus douched with 50 per cent. alcohol. Has been dribbling of urine which contains albumin, many pus cells and nonspecific diplococci. Some improvement under ice and opium. Sixth day, A.M. temperature 35.7° ; pulse, 96. No sleep, some vomiting. Abdomen still distended. Diaphragm driven upwards. Liver dullness much lessened. Pulse small and weak; respiration, labored; hiccough; no flatus. Dullness of lower parts of abdomen increased in extent. Sharp meteorism. Laparotomy: Quantity of dark red fluid, mixed with flakes of pus, evacuated. Douglas' pouch full of pus. Fluid showed pus cells and some diplococci. Examination was not complete. Patient gradually recovered and was discharged in about ten weeks. Eight weeks after operation there was a thick, creamy, purulent discharge from the urethra and cervix. This was full of typical gonococci.

CASE II.—Showed some variation from the foregoing. Child seventh day post-partum; temperature, 40° ; pulse, 108. Abdomen sensitive to pressure, but not distended until tenth day. Eleventh day, hard mass to right of uterus. Patient restless and delirious. As no improvement followed the usual treatment, laparotomy was done on the evening of the twelfth day. Discharge of cloudy, flocculent fluid. Intestinal serosa injected and covered in places with grayish deposit. Pus washed out. Lymph vessels about uterus enormously distended and filled with pus. Deposits of fibrino-purulent material, particularly about tubes; that of the right side showed lymph vessels filled with pus. Death on fifteenth day. Post-mortem examination: Purulent peritonitis and metrolymphangitis, edema and hyperemia of lungs. Hypertrophy of left ventricle of moderate degree. Moderate enlargement of spleen. Perivascular tissue markedly edematous.

These cases in contrast tell the whole story and require but little comment. The first was one of relatively low temperature

and not too rapid pulse, but the symptoms of advancing peritonitis were too pronounced to be ignored. It is just such a case as will test the courage of the physician, try his skill, and leave him in the lurch in the vast majority of cases—in even a greater percentage than that quoted from Osterloh. I question whether any one, called upon the sixth day, would have given anything but a fatal prognosis. More than this, there could be no doubt at the time of operation that there was sufficient systemic involvement to have justified one's worst fears. The second case simply proves the last statements. "Too late," are the words Leopold uses, and the post-mortem examination demonstrated the truth of the remark.

Now, the all-important fact is, that even upon the sixth day post partum, with the whole peritoneum involved, the abdomen full of grumous fluid and Douglas' pouch full of pus, opening the abdomen, evacuating the fluid, washing with normal salt solution and counter-drainage through the vaginal vault—the various steps of the operation—resulted in the cure of a case which under any other line of treatment would have been fatal almost with certainty. This, too, upon the sixth day, or, better expressed for our purposes, within forty-eight hours after the appearance of the symptoms of sepsis. This period may be taken, therefore, as approximating the proper time for operation. Sippel gives thirty-six hours as the time for interference. It will take about forty-eight hours for the ordinary and nonoperative measures to demonstrate their efficiency or otherwise, and one would scarcely be supported by authority should one interfere, surgically, before that time. This, always with the proviso that the judgment of the operator does not demand an earlier effort. This judgment, to my mind, should be untrammelled and based upon experience, not the driving of a furor operandi, the desire to do something bizarre.

Another point of importance should not be overlooked. In this first case, although no leucocyte count was made, and no culture of the blood was carried out, there can be but little doubt that the general system was more or less involved. This is the bugbear, this fear of operating unnecessarily, this dread of adding to the dangers through which the patient has to pass, by operating after the general system has become involved.

Without wishing for a moment to advocate reckless surgery, or hopeless operations, it may not be amiss for me to say that,

even in cases of systemic involvement, the early operation with its thorough cleansing of the parts, its thorough draining of the abdominal cavity, may so restore the resisting power of the peritoneum, the salt solution may so restore the phagocytic power of the white corpuscles, that the patient may be rescued even when the system generally is saturated with the poison.

I have collected from the literature as many additional cases as I could find, and submit a short résumé of each herewith. Only those which were given with any detail have been utilized, and I am satisfied that numbers of others of a similar nature have been operated upon, and possibly reported.

Leopold (Op. cit.) reports an additional case: "VII-para; abortion three weeks before; ill since then. General peritonitis; laparotomy; drainage through Douglas' pouch; recovery."

Kownatzki²² reports four cases:

CASE I.—Term; third day, chill and fever; peritonitis; laparotomy, twelfth day; drainage; recovery.

CASE II.—Term; third day, fever and pain in abdomen; laparotomy, seventh day; recovery.

CASE III.—Laparotomy, eighth day; recovery.

CASE IV.—Abortion; fever, sixth day; laparotomy; recovery.

Sourdille²³ reports five cases of laparotomy and drainage, with one death.

Hysterectomy.—No part of this whole subject has been so thoroughly discussed as has the advisability of removing the uterus in cases of puerperal infection. Starting with the assumption that the removal of this organ would do away with the seat of primary and continuous infection, the whole power of the obstetrical world was concentrated upon this one aspect of the matter.

Fehling⁴ sent questions to 140 gynecologists in Germany, Austria and Switzerland. Ninety-four answered; 41 had never operated for either sepsis or rupture of uterus; 53 gave satisfactory answers.

There were: 60 operations for puerperal sepsis; 19 abdominal total extirpations with 31.5 per cent. mortality; 33 vaginal total extirpations, with 69.6 per cent. mortality; 4 supravaginal amputations, with 50 per cent. mortality; 4 total extirpations after abortions, with 75 per cent. mortality. Mortality for the 60 operations. 55.7 per cent.

Trotta²⁴ collected 46 cases, mortality, 45.6 per cent.; 21 abdominal hysterectomies, with 45.1 per cent. mortality; 24 vaginal hysterectomies, with 54.1 per cent. mortality.

All of these operations were performed before systemic infection. Fehling draws the following conclusions, viz.: "I. Hysterectomy in general sepsis is useless and to be condemned. II. Hysterectomy is to be recommended: a. When intoxication or infection is limited to uterus. 1. In degeneration of retained placenta or parts thereof; 2. in degeneration of puerperal myomata; 3. in degeneration of placental remains after abortion, when these cannot be removed in any other way; seldom necessary. III. Occasionally, in cases of metrophlebitis puerperalis (pyemia), hysterectomy may be useful, particularly when done in connection with extirpation of thrombotic veins."

It is remarkable that the mortality of total extirpation of the uterus is higher when performed per vaginam than it is when carried out through the abdominal route, and especially remarkable is it that after abortion this mortality should be highest of all. In spite of the opposition which hysterectomy has evoked, it is at least worthy of careful consideration that while the general average of mortality as shown in Fehling's and Trotta's cases (106 in all) is but little over 50 per cent., that of Osterloh⁵ was 50 per cent. in nonoperative cases. But this does not give a fair representation of the case, for the reason that in every instance the vaginal extirpation had a greater mortality than had that by the abdominal method, and the extirpation after abortion in Fehling's cases was 75 per cent. These two percentages bring the general average up to the high figures already mentioned. If, however, one takes only the cases which were operated upon by the abdominal method, 19 in Fehling's and 21 in Trotta's, the average mortality was only 40 per cent., a decided gain over the mortality of Osterloh's unoperated cases.

On the other hand, Treub³ reports 36 cases of hysterectomy for puerperal sepsis, with 21 deaths, a mortality of 60 per cent. As no specification as to method employed is given, it is not impossible that this rate might be lowered, if only the abdominal sections were reported separately. In the absence of more definite information, however, the high rate must be accepted.

Boldt has reported one case of hysterectomy for involvement of veins and two for general peritonitis.

CASE I.—Involvement of veins. Fourth day, vaginal hysterectomy, then laparotomy and removal of thrombotic veins and broad ligament; recovery. (Boldt.²⁵)

CASE II.—General peritonitis. Primipara; normal delivery; fourth day, 104°; seventh day, 107°; chill, delirium; anti-streptococcic serum; improvement. Nineteenth to twenty-third day, fever and chills. Twenty-third day, hysterectomy (abdominal); general peritonitis, fundus uteri gangrenous; death. (Boldt.²⁶)

CASE III.—Fourth day after abortion, diffuse peritonitis; hysterectomy and salt solution; drainage per vaginam; death next day.

Suppurative inflammation of body and cervix, all coats being infiltrated with epithelial cells, and polynuclear leucocytes. At rare intervals, pockets of pus. Uterus and cervix showed many bacteria. Small diplococci and streptococci. Some involvement of tube, but this was not general. (Boldt.²⁷)

In this paper I have collected thirty-one cases of operation in puerperal sepsis. Following the plan as laid down, these may be divided between the different groups as follows:

I. General peritonitis: No. of cases, 12; deaths, 2; recoveries, 10.

II. Involvement of veins: No. of cases, 4; deaths, 1; recoveries, 3.

III. Localized infection: No. of cases, 5; deaths, 2; recoveries, 3.

IV. Abscesses of muscularis, etc.: No. of cases, 3; recoveries, 3.

V. Infection from tumors, etc.: No. of cases, 1; recovery from infection, 1.

VI. Irremovable placenta (hysterectomy): No. of cases, 3; recoveries, 2. Hysterectomy: No. of cases, 3; deaths, 2; recovery, 1.

"Too late" are the words to be written over the records of most of the cases of death, and yet, with it all, there were only seven deaths in thirty-one cases, a mortality of 22.6 per cent.

For the cases of general peritonitis (Group I) of the twelve patients operated upon, two died, one at least of whom could probably have been saved if the operation had been performed

early enough. Of the cases of hysterectomy, including, as should be done, the three cases of operation for irremovable placenta, two died, and at least one of those could have been saved if the operation had been done earlier. As it is, the mortality was only $33\frac{1}{3}$ per cent.

The significant fact is that all these rates of mortality are far below those given in other computations, far below that in the nonoperated severe cases as reported by Osterloh. In spite, though, of the limited number of cases, and they probably represent a fair average for any three years, in spite of the mortality, two things stand out prominently; one, that there is less dread of attacking these cases early, and one, that the mortality is not so high as we have been led to believe.

Another significant fact is that puerperal infection plays a varied rôle in different individuals, running, as it did, in one of the cases, fifty-nine days, in another forty-nine, in seven, from three to four weeks, and yet of these nine only three died. The resisting power of the individual must have been very great in each case, and the conclusion is forced that probably with an early surgical interference all might have been saved.

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TYPHOID FEVER OCCURRING DURING PREGNANCY.

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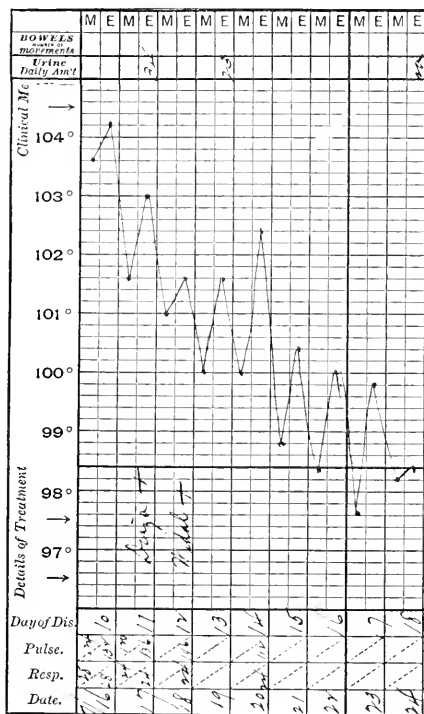
(With three charts.)

THESE notes are presented to record the observations of a few cases of pregnancy complicated by typhoid fever and one case of pregnancy occurring during convalescence from a severe attack of typhoid. Any conclusions drawn from such a small number of cases are erroneous.

We have been led to believe by some authorities that pregnancy rendered the woman practically immune to typhoid; later, as more cases were reported, the idea prevailed that while pregnancy did not confer an immunity, it at least prevented a severe attack, and then later, when we found in the past epidemics of typhoid more cases and some of severe infection, the conclusion was expressed that there is no practical difference in a large series of cases in the severity of typhoid occurring during pregnancy and in the relative number of severe and mild toxemias from the typhoid infection. There has always been noted a large percentage of abortion, depending upon the height of the fever and the time of the infection. The complications of abortion and labor are especially prone to show themselves in such patients. Fetal infection is now established beyond a doubt.

CASE I.—Mrs. C., a multipara 30 years of age, presented a very good family and personal history, having never been ill. Was pregnant, the period estimated at between the sixteenth and seventeenth weeks, when she had a severe attack of chills, one lasting

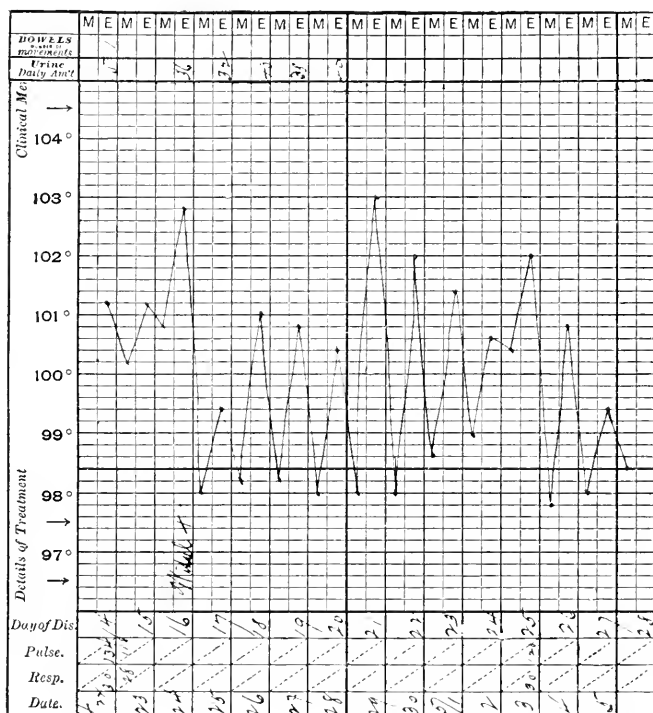
three hours, and then mild chilly sensations for five days, rise of temperature, nausea and vomiting, some cough and no expectoration, marked epistaxis, headache, and pain in back and limbs. At the end of ten days she developed typical rose-colored spots on the abdomen; the spleen became enlarged. A Widal test made in the City Laboratory gave a positive reaction. The patient was



Case I.

moved to the hospital, where she ran a temperature of rather mild course, the highest being 104.4° on the tenth day, and from which a rapid decline was made to normal on the eighteenth day, after which the temperature remained normal. She was discharged from the ward about the fortieth day, having made a seemingly perfect recovery and retained the fetus, then of about twenty-one to twenty-two weeks' gestation.

On the forty-fourth day from the inception of the fever she suddenly developed labor pains, and in spite of opium suppositories and an ice bag she aborted. Nothing unusual had occurred the day of abortion. She was a sensible white woman and anxious to have another child; the pains came on at night in bed. The fetus came away intact, the membranes not rupturing.



Case II.

Marked relaxation of the uterus developed, and she bled very freely, in fact, freely enough to make some impression on the pulse and respiration, in spite of ergot and hot douching. Before preparations for packing the uterus were completed, however, the uterine muscle responded and the bleeding decreased; the uterus was not packed. The next day she discharged a large blood clot from the uterus with some pain. Barring a rise of temperature to 100° on the second day, she made a perfect recovery, although she

was quite weak for several days. Some six months afterward she again became pregnant and carried the child to term.

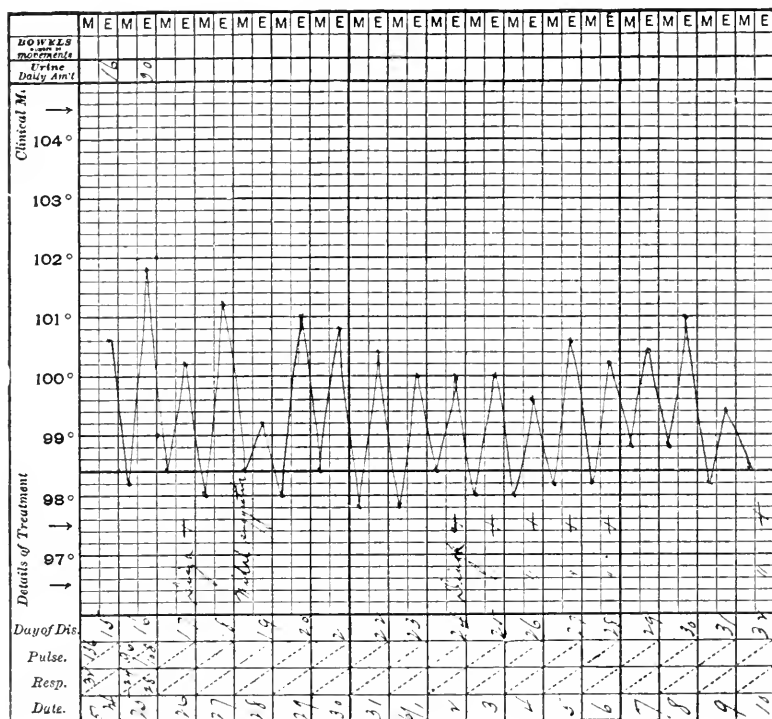
CASE II.—Mrs. A. W., a primipara, 19 years of age, of very good family history, had never been ill in her lifetime until the present attack. Seven months pregnant, and since the beginning of pregnancy she had been feeling nervous and indisposed; had been in bed for two weeks, complaining of headache, backache, no diarrhea. The nose had bled four days previously. She had developed a mild temperature. When seen, on April 22, 1902, the temperature was 101.2° ; the heart and lungs were normal, abdomen soft and not at all distended, spleen palpable, no rose spots. A Widal test at the City Laboratory gave a positive reaction, the diazo reaction not being found in the urine. She ran a temperature of peculiarly mild range, at no time demanding any hydrotherapy to reduce it, and yet susceptible to change in diet. On the twenty-first day eggs were added to her diet, and the temperature for five days showed a slight recrudescence, reaching normal permanently on the twenty-eighth day. Convalescence was uninterrupted. The patient went to term and was delivered of a healthy child.

CASE III.—Mrs. S. P., a primipara aged 22 years, whose family history is clear of any hereditary taint, who personally had not been ill in her lifetime, during the seventh month of her first pregnancy experienced some headache, lassitude, nausea and slight cough, no evidence of bowel infection, nor any epistaxis. Seen May 24, 1902, the fifteenth day, as far as could be estimated from her mild symptoms, temperature was 100.6° , urine giving a marked diazo reaction, the blood showing a leucocyte count of 7,000, with a suggestive Widal reaction at the City Laboratory, and a few days later a positive reaction. At no time during the succeeding three weeks did the temperature rise above 101.2° , the patient apparently well and restless at being retained in bed, and yet upon attempting to get out of bed the temperature showed a tendency to stay above normal when before it had reached normal or subnormal each day. The diazo reaction persisted in the urine until the thirty-second day, when the temperature reached normal to stay so. The patient went to term and was delivered of a healthy child.

CASE IV.—Mrs. G., aged 19, a mulatto, primipara, was delivered of a full-term child, July 14, 1903; labor somewhat difficult on

account of rather weak expulsive efforts. Second stage lasted five to six hours. Forceps was not used.

At 6 A.M. the following day, on waking, the patient was absolutely blind, delirious, and urine scanty: temperature, 100.4° . During the day she continued heavy and toxic. Calomel in divided doses was started at 6 A.M.; active diuretic measures were instituted. Temperature at 6 P.M. was 101° , lochia normal in



Case III.

quantity and odor. July 16, had spent a more comfortable night; could see an object placed before eyes, but could not count fingers; headache gone; temperature 100.8° . In the afternoon, temperature 101° ; child well. July 17, A.M., temperature 99.4° ; could count fingers; urine freer and of sufficient amount for examination; contained trace of albumin; no casts; specific gravity 1.025. From this time the temperature remained normal and in one week she could see very well. In February and March of 1903 this

patient passed through a severe attack of typhoid fever at the University Hospital. She was five weeks in the hospital, three weeks at home. She carried the child to term and has since done well.

The last case is one not of typhoid infection during pregnancy, but of pregnancy occurring during the early days of convalescence from typhoid.

CASE V.—Mrs. M. passed through a severe attack of typical typhoid and came under our care for a relapse occurring soon after defervescence; the relapse proved quite severe also, and she again developed a slight intercurrent relapse; convalescence normal. Some weeks after discharge she came to be treated for amenorrhea. This sequela of typhoid was fully explained and a tonic given for anemia. She appeared again after the time for her period, when a possible diagnosis of pregnancy was made. At between the third and fourth months she aborted without, as far as I could ascertain, any exciting cause, a three to four months' fetus coming away.

The temperature records of the majority of cases of typhoid fever occurring during pregnancy are modified in some manner from those of typhoid not combined with pregnancy. Just as the mixed infection of typhoid and malaria may occur where the course of one or the other disease is modified or held in abeyance during the height of the more toxic infection, so pregnancy and typhoid may be considered a mixed infection, the human parasite now considered, as our knowledge of syncytial tissue grows, as much of a menace to the life of the patient as any other parasite of the same type would be. After the growth and formation of the placenta, when the embryo becomes the fetus, the blood of the mother generates in the serum antibodies which antagonize the invasion of syncytial tissue, and as the fetus grows older the blood becomes more and more resistant to infection and we find the following to be true: In a typhoid infection occurring in a pregnant woman before the fourth month, the typhoid fever will prove the predominant infection, will develop a higher temperature than at a later date, and the patient will, in as high as 85 per cent. of cases, abort. The temperature as a rule falls at the inception of pains and rises the day following delivery. The pulse usually approaches normal also and rises with the return of fever. In a typhoid infection occurring later than the sixth month the pregnancy will prove the stronger infection; the course of the typhoid

fever will be modified greatly and even at times so held in abeyance, as in two of the cases above noted, that the patients will not experience the slightest discomfort beyond the first symptoms of the infection. The temperature records prove of a flaccid, weak type, the patients are relatively less toxic, and will usually carry the child to term.

The question of the cause of abortion is interesting. No doubt when the temperature ranges above 104° the fetus or ovum cannot survive, and we find in severe infections abortion occurring at the height of fever; also in fetal infection it is right to suppose that perhaps the fetus may die when the mother survives, and in some cases the death of the fetus may be due to fetal infection; but this leaves a large number of cases similar to the first noted, in which the patient aborts after the temperature has reached normal and when, up to the day of abortion, she has appeared to be convalescing normally. The abortion must come from one of two sources: either the blood of the mother refuses to furnish food for the growing embryo, and also, as we above noted, furnish serum for antibodies when already her cells are crowded with antityphoid serum, or again perhaps the antityphoid serum may also act as an antibody to the growing ovum; and, second, is there not a possibility of some degeneration occurring in the endometrial tissue in a somewhat similar manner to the results of typhoid on the muscular and nervous tissue of the other parts of the body, the uterus becoming not a fit ground for growth?

In conclusion, let me make the following comparison: The theory has been advanced by a French obstetrician of some prominence that he had noticed that, in cases of puerperal infection in which a localized breast infection developed, the patient recovered. From this clinical fact he deduced the theory that the antibodies of the blood and cells generated by pus contained in a localized cavity were more rapid in their development and caused a certain immunity to a general infection.

The question of mixed infection as protective is continually cropping out in preventive medicine. Are we therefore led to believe that there is something generated by the pregnant woman which in a certain measure does protect her from the more virulent attack of the toxins of typhoid fever, and that the course of the typhoid fever during pregnancy is undoubtedly modified should it occur at such a period of pregnancy that the serum or cells have been charged with immunizing bodies?

SIGNIFICANCE OF UTERINE HEMORRHAGES OF
THE MENOPAUSE.*

BY

GRACE PECKHAM MURRAY, MD.,

Member of the American Medical Association, New York State Medical Society, Academy of Medicine, New York County Medical Society, New York Neurological Society, Women's Medical Association, Professor Adjunct in Women's Diseases, New York Post-Graduate School and Hospital, etc.

It is generally accepted that the menopause begins with the cessation of menstruation or marked menstrual irregularities, and ends with the termination of the varied disturbances incident to this period. Such is Leuf's definition, and it answers the purpose as well as any. The time of the commencement of the menopause has been amply discussed by Tate, Kisch, and other well-known authorities, who bring numerous statistics to prove their assertions. They agree that with the great majority of women it commences at the age of forty-five and ranges from that year up to fifty. My observation would lead me to say that with New York women the commencement is much later. Many assert that the menopause is later with married women than with single, but I do not think such is the case.

The accurate knowledge of the anatomical and physiological conditions which underlie the changes of the menopause are woefully lacking, and to this is due the confusion and misunderstanding of the group of symptoms, local, circulatory and nervous, which are covered by the popular term, "change of life." Dr. John D. Clarke, in his article on "The Anatomical Basis of the Menopause," says it is solely dependent upon the degeneration and structural changes in the intra-ovarian vascularization which at first limits and afterwards abrogates the development of the primitive follicles. Certainly the menopause is not brought about through the disappearance of the follicles, for follicles may still be found in the ovaries of women years beyond the menopause.

Recent writers aver that hemorrhage at the menopause is not as common as formerly supposed. Dr. Duff, in his paper

*Read before the Section on Obstetrics, New York Academy of Medicine, March 22, 1906.

on "Hemorrhage of the menopause," reports the examination of 482 healthy women. He found only 39 who gave a history of what could be termed hemorrhage during the menopause, and of that number, only five gave a history of menorrhagia of any importance. Dr. C. Lockyer, in his paper on "Hemorrhage at and after menopause," reports that out of 871 cases, 662 gave no history of loss of blood, and 209 had either menorrhagia, metrorrhagia, or a sanguineous discharge. Excessive flow, amounting to hemorrhage, was thought, by the majority of physicians, to be a natural accompaniment of the menopause up to the time that Dr. Duff wrote his paper in 1899. This paper was widely read, and the publication of a number of papers containing similar observations was the result. Up to that time the medical fraternity, other than gynecologists, were of the opinion, which was then and still is the popular belief among women, that a profuse flow is one of the ordinary symptoms of the menopause and is not to be regarded with alarm. Speaking of the menopause, Leuf says: "Bleeding from the uterus may vary from the mere occasional appearance of blood in the vaginal discharge to a steady flow that soon proves fatal if not arrested; sometimes the increase is very irregular in amount and in times of occurrence, but dangerously profuse in amount. In short, bleeding from the womb may occur continuously or at intervals, in amount varying from the smallest to a fatal hemorrhage." In the *Cyclopedia of Obstetrics and Gynecology*, Dr. E. Borner, who writes upon the subject of the menopause, voices the opinion previously taught, as follows: "As regards the manner of cessation of menstruation every possible variation is observed. The time of its appearance is delayed. The interval becomes longer (six weeks to several months) or shorter, (fourteen days). The flow continues longer, often during the entire menstrual period; there is seldom a diminution of the amount. Continuous and slight losses of blood often alternate. The quantity is often much larger than usual and may amount to a perfect out-gush. Between the periods we again observe, for some time, insignificant hemorrhages. The amount of blood lost during the time of the climacteric is rarely less than during the early normal periods. The blood is often watery and darker than usual, and is frequently mixed with a quantity of mucus." He goes on to say that the condition described is the one commonly observed. "Less often

the period ceases suddenly, the patient suffering more or less, or the menstrual flow may gradually decrease, becoming less and less until it finally ceases entirely."

The above statement is generally believed in, as I have before said, by the majority of physicians, except some gynecologists. The important questions are: Is an increased flow at the time of the menopause physiological and is a hemorrhage, either that of menorrhagia or metrorrhagia, merely functional and not a pathological condition?

I have studied this question now for more than twenty years, and I had hoped to substantiate my opinions by tables confirmatory of it. Very much of my work in this direction as well as of other symptoms of the menopause, for seven years, was inadvertently destroyed, and I hope, at some future time, to furnish tabulated statements, but I think observation and experience bear me out in the following conclusions in regard to the matter under discussion. The normal change of life I believe is established without an increased loss of blood. The flow is less during the second decade of menstruation than the first; less during the third than the second. At the period of cessation it decreases, coming slowly, less in amount of flow and less in the time occupied by the flow. It becomes thinner, more mucoid, and, as it comes more slowly, it decomposes and gives rise to that odor so dreaded by women of middle age and so likely to occur, unless special pains are taken in regard to cleanliness. I have seen a number of cases in which the cessation of the menses has taken place without any intervals occurring between the regular times, but more frequently intervals of a month, two months or more occur, the usual type being that the times are lengthened by a month or more, so that three or four or six months may intervene.

I do not think that an increase of flow is a normal condition, and I have yet to see a case in which there did not exist some reason for the seeming increase. This opinion is confirmed by many recent writers. Dr. Duff states: "I do not believe hemorrhage is a necessary concomitant of the menopause." He wavers, as he further says: "When it does occur, otherwise than as a menorrhagia, in the true sense of the term, it is in 95 per cent. of the cases significant of a pathological condition." From which he would seem to admit that in 5 per cent. of cases it might be normal, and yet he further adds, after giving his

statistics, "I cannot see how any physician can agree as I have heard them do, that hemorrhage during the menopause is not, as a rule, significant of disease."

Dr. E. C. Davis is more positive in his statement: "The menopause is a physiological condition and should be entered upon by a woman with normal genital organs without pathological disturbance. * * * When the menstruation has ceased and the menopause is reached, any hemorrhage from the uterus is always pathological, and should be carefully investigated to determine its cause, while the prospects for relief are fairest."

Dr. Cook says: "There is no reason why flooding should occur from a normal uterus at the menopause; the reverse should be the case, and uterine disease should be thought the cause rather than that the hemorrhage should be attributed to change of life."

Dr. W. H. Baker states: "There exists no good and sufficient reason for the popular opinion that of a necessity and as a material result the cessation of menstruation at the climacteric should be accompanied by excessive hemorrhage."

Dr. Hanfield Jones, after examining his cases extending over several years, refutes the statement that it is common to find the period of the menopause characterized by hemorrhage of a functional nature and independent of organic disease in the uterus and its appendages, and adds that excepting one or two doubtful cases every one could be referred to a definite, though perhaps relatively slight, structural cause, upon the removal of which the hemorrhage ceased.

Other writers take the ground that, while generally an excessive flow at the menopause sufficient to be considered a hemorrhage is pathological, there are instances in which it is not indicative of a pathological condition; that is, that a small percentage of cases occur without some manifest anatomical cause. Dr. Quiesner says that one can speak of a purely climacteric bleeding without an anatomical change.

Thus we have the ordinary authorities writing on the subject of the climacteric, speaking of excessive flowing amounting to hemorrhages or continuous loss of blood daily for a length of time as not unusual, but simply due to change of life. Within the last few years men have sounded a warning against such a dangerous attitude, and have given their opinion that a thorough

research will always reveal a cause, removal of which will relieve the hemorrhage, while a number of others incline to the opinion that while not nearly so frequent as formerly supposed, there exist cases in which excessive loss of blood takes place independently of any pathological condition; in other words, that it is a physiological state exhibited at the time of the commencement of the menopause. It is certainly very difficult to prove absolutely that the latter opinion is entirely incorrect, but the results of investigation go far toward doing so.

A wide range of conditions will cause an abnormal loss of blood at the time of the menopause. Troubles other than local are said to bring about hemorrhages at the time of the climacteric, such as congestion of the liver; cardiac, splenic, and renal affections; the dyscrasias, such as anemia, purpura hemorrhagica, and hemophilia. A hemorrhage may have a nervous origin. This is often seen during the entire menstrual life of a woman. Anger, grief, shock, may either increase the flow or diminish it, or cause it to cease. I have known of a case in which a premature menopause has been occasioned by grief and shock even at the age of twenty-two. Cases in which a constant loss of blood takes place, due, as the patients think, to change of life, may prove, upon examination, to be occasioned by hemorrhoids or earuncles, or the bleeding of erosions of a completely prolapsed uterus. The uterine hemorrhages are often produced at this time by causes which obtain throughout the menstrual life of a woman, but are more likely to occur when she has become advanced in years and her sexual organs have been more exposed to disease by her mode of life, her marital relations, and frequent pregnancies resulting in childbirth and miscarriages. In fact, I believe that this is the great reason why an excessive loss of blood has come to be considered concomitant with the menopause. Such inflammatory conditions as cervicitis, endometritis, and metritis come in this category, as do the hyperplasias which result from long-continued inflammations, benign growths, polypi, and fungoid endometritis. Fibroids, especially the intramural type, are not infrequently found, and a condition which is rarely noted exists, that of a fibroid infiltration, a myofibrosis of the uterus, which gives rise to an intractable bleeding which defies medication and treatment, also diseases of the tubes and ovaries. Hemorrhage at this time is often a symptom of carcinoma, as is well known.

This subject has been dwelt upon at length to point to the great necessity of an early and immediate examination in such cases, and the danger of remaining passive in regard to local examinations under the erroneous impression that hemorrhages of the menopause are a purely physiological phenomenon. Some writers state that more than half of these cases of loss of blood at the menopause are due to carcinoma. This, I should say, is an exaggeration. The most intractable bleeding results from sarcoma, which, though often spoken of, is exceedingly rare. Another group of cases is composed of those who have vascular disturbances, due to interference of the circulation of the uterus or change in the blood-vessels themselves. Scanzoni wrote of senile rigidity and friable condition of the arteries; Kisch, of the softening and relaxation of the uterine tissues. Arteriosclerosis of the uterus has been ably discussed by Dr. Robert L. Dickinson and others. Dalche remarks that a sclero-atheromatous condition of the arteries which has led to hemorrhages can be determined only by a necropsy. Dr. Lockhardt refers to a case in which he had made a diagnosis of uterine hemorrhage as resulting from atheromatous condition of the uterine arteries, because such was the marked condition of the blood-vessels in other parts of the body, but when he removed the uterus the condition was not found.

This whole subject of hemorrhages of the menopause has hitherto been neglected because of the wide acceptance of the belief that in a majority of instances such excessive loss of blood is physiological when no inflammatory conditions or carcinomatous or benign neoplasms exist. A diligent study of the histology, normal and pathological, of the uterus and its appendages at the time of the menopause is urgent upon us to bring about a better understanding of the problems which the climacteric presents, not only of the hemorrhages and other vascular changes, including the vasomotor symptoms, but of those which relate to the nervous system as well.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of April 10, 1906.

The First Vice-President, DR. J. N. WEST, in the Chair.

Papers were read by DR. FRANK R. OASTLER, on

THE PROCESSES OF REPRODUCTION.*

DR. GEORGE GRAY WARD, JR., on

THE CAUSES OF STERILITY.†

DR. J. DOUGAL BISSELL, on

STERILITY AND ITS SURGICAL TREATMENT.‡

DR. WILLIAM M. POLK said there were one or two points concerning which something might be added, especially in regard to the surgical treatment of sterility. While the male, as one of the speakers had pointed out, was frequently responsible for the sterile condition of the female, very little light had thus far been thrown upon the fecundating properties of the spermatozoa; we simply knew that when the vitality of the spermatozoa was impaired, sterility resulted. Greater exactness in this direction was desirable.

An interesting question in connection with this subject, which was touched upon by Dr. Oastler, was the influence exerted by the temperament or type of the woman. A recent writer had divided the female sex into two classes, namely, those who had highly developed maternal instincts, which dominated them, and another class, of course, not sharply defined, in whom the erotic element predominated. The prostitute, the writer claimed, belonged to this type, and the type was much less apt to conceive than the former. Much, Dr. Polk said, could be brought out in favor of such a theory, which had a direct bearing upon the matter of temperament.

The condition of the vaginal secretions had an important bearing on the matter of sterility, and in an appreciation of that fact lay the secret of the success of the cures that had been secured by the various "water cures" at Franzenbad and other well-known spas. The free use, general and local, of the al-

*See original article, page 145.

†See original article, page 158.

‡See original article, page 169.

kaline mineral waters at these resorts, had a corrective effect upon the gouty diathesis in these cases, and changed the condition of the secretions in the vaginal and cervical canals. The local use of solutions of bicarbonate of soda had a similar effect.

Structural changes in the genital canal that had any bearing upon this subject were so well understood and had been so thoroughly and completely dealt with, it was scarcely necessary to refer to them further. It was often beyond us, however, to ascertain the exact condition of the ovary and appendages. All the work done in that connection since the time of Spencer Wells went to prove that, providing one oviduct was intact and in good order, the possibility of procreation, even with only a small part of an ovary in position, was pretty well established in the affirmative. Assuming, then, that the woman had a good set of tubes, or even one good tube, it became a matter of very great importance to preserve as much of the ovarian tissue as possible, because the more tissue there was left, the more apt was the function of the ovary to be carried on. The methods of treating the affected ovary so as to preserve as much tissue as possible were well known; the fundamental principle was to sacrifice as little of the healthy ovarian tissue as possible. Transplanting an ovary was still *sub judice*. The greatest difficulty lay in the treatment required by the oviducts. Here rested the greatest puzzle, which still had to be worked out. A thickened, contorted tube, with an outer opening closed and mutilated, seemed scarcely a thing to preserve, and yet it might be done without risk to the patient if vaginal drainage were provided, and even this could be dispensed with if there was no pus accumulation in the infundibulum. The conditions present in the hydrosalpinx type of tube were the most hopeless, the structural changes being here greater and more pronounced than in any other condition found. Of course, tubercular disease was prohibitive, and the same might be said of inflammatory processes in acute or active stages. The periods of resolution were best for our purposes, and the more complete this was, short of extensive destruction of the several coats of the tube, the better would be our results. The operative devices designed to restore or maintain the function of the tubes were well known, and with our knowledge of the uncertainties connected with such attempts, the gynecologist should be careful to avoid promising too much. If, after a frank statement of the results to date, the patient decided to accept our attempts, then we were warranted in operating upon the appendages for the express purpose of curing a sterility which could be attributed to them.

TRANSACTIONS OF THE SECTION ON GYNECOLOGY OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting of April 19, 1906.

The President, DR. JOHN G. CLARK, in the Chair.

DR. C. C. NORRIS reported

TWO CASES OF BILATERAL DERMOID CYSTS: ONE SHOWING CARCINOMATOUS DEGENERATION, THE SECOND COMPLICATED BY THE PRESENCE OF AN EIGHTY-ONE POUND MULTILOCULAR OVARIAN CYST.*

DR. EDWARD A. SCHUMANN read a paper entitled,

ADENOCARCINOMA OF THE ABDOMINAL WALL DEVELOPING SUBSEQUENT TO THE REMOVAL OF BENIGN OVARIAN NEOPLASMS.†

DR. H. D. BEYEA.—There is no question but that this tumor at the time of the primary operation was thought to be benign, a glandular cystadenoma of the ovaries. It developed directly in the scar, seemed to be attached throughout its whole length, and extended for some distance above and below. All of it was in front of the peritoneum. I dissected out as carefully as possible, going into the peritoneum so as to remove all possible malignant tissue. A large part of the rectus muscle was also removed. Later, x-ray treatment was given by Dr. Shober and afterward by Dr. Pancoast, at the University. Dr. Schumann has pretty well described the tumor. It was not at all similar to the multilocular growths. It contained no pseudomucin, but caseous material, as if it were undergoing degeneration.

DR. WILMER KRUSEN.—Although it may not be pertinent to the subject of benign neoplasms I might say that two years ago I operated upon a patient 29 years of age for squamous celled epithelioma of the cervix. The disease recurred rapidly and within three months there was evidence of cancer in the scar. Although the abdominal wound was freely movable and not tightly attached to the scar tissue, this cancer developed anterior to the peritoneum.

* See original article, page 792. Vol. LIII.

† See original article, page 187.

DR. D. M. BOYD presented

A REVIEW OF FOURTEEN CESAREAN SECTIONS SUCCESSFULLY
PERFORMED.*

DR. STRICKER COLES.—I would like to have heard Dr. Boyd speak of the mortality following his operations. He mentioned one case in which his patient was in fairly good health after three Cesarean sections; but most of his cases have had craniotomies, or difficult forceps operation which would give bad after-results. We want not only to accomplish safe deliveries, but also to leave the patient in good condition. I am in favor of broadening the field of Cesarean section. When we can save the life of the child and of the mother, as we can when we have the woman early enough, it should be done. I still hold, however, that induction of labor is an operation which should be largely employed. It is not to be abused, and I do not think the induction of premature labor should be done too soon. This would give poor results to the child's life. The cases in which I have used induction of labor with the best results are those in which there is a tendency for the pregnancy to go over time. For instance, I recall three cases in which the woman had lost four children. The development of the child's head would certainly indicate that the gestation had gone beyond the normal period. One case consulted an obstetrician, but he assured her that there would be no difficulty. He examined her four weeks before labor, but he did not consider that the child was going to continue growing. At the time of labor, after waiting for dilatation of the parts and for the child to be expelled, they sent for me. I found a parietal presentation with depressed fracture of the parietal bone. The head had not engaged and the only way I could attempt to deliver the child was by version. The child was lost. Such cases as this are those in which induction of labor is *the* operation. The estimation of the period of gestation does not usually bother me. I base my judgment as to time for inducing labor upon the examination—fitting of the child's head into the pelvis. I have used the bougies and my method is to remove the bougie as soon as labor begins and allow the labor to proceed normally. When considering the mortality of Cesarean section, we should not take statistics based upon an operation done twenty or more years ago, but upon those done in the last five years. We will find in this way that operators have had a large number of Cesarean sections with small mortality, less than 5 per cent. We can save not only the child but the mother in a great many cases, and leave her in good condition.

DR. WILLIAM H. NICHOLSON.—I fully agree with what Dr. Coles has said regarding the method of treatment of these cases

* See original article, page 214.

of contracted pelves. The determination of the period of gestation by the woman's menstrual history may often be difficult, particularly in women whose menstruation is irregular. If, however, there is a careful estimation of the relative size of the child's head and the particular pelvis there is really little difficulty. The attempts at actual measurements of the fetal head have been of no value. Regarding the method of induction of premature labor, I think those who simply use the bougies wait much longer than is necessary for the results. I think the Voorhees bag or similar device is a great addition to the bougie method. I do not take the bougies out until the labor is well under way, and I have not seen any bad results. A good deal of the difficulty in labors induced by those not accustomed to the work is due to the fact that the bougies are placed in the lower uterine segment and stay there without bringing on labor. The statement that a previous labor is a guide to subsequent ones is apt to deceive the obstetrician, because a woman is often better able to deliver herself with the first child than with the second, owing to the strength of the muscular contraction of the uterus. With reference to pubiotomy as a substitute for Cesarean section, it is interesting to note that in the work of the Germans there is a strong tendency to discard the operation so praised by Döderlein, because of its difficult nature and because it does not give better results than symphyseotomy, and also because in doing a pubiotomy it is necessary to do a vaginal operation. One of the most interesting phases is the question of abdominal Cesarean section taking the place of accouchement forcé in certain cases of eclampsia, placenta prævia, and previous separation of the placenta with undilated cervix. In extremely rare cases there is an indication for the performance of Cesarean section in all of these conditions. As a rule other and conservative methods are indicated, the most radical method required in a hospital clinic being probably the so-called vaginal Cesarean section, which, of course, is a misnomer. It seems to me, however, that if a man is "up against it" in a private house, the patient having an undilated cervix and being within a month of term, an abdominal Cesarean section would be better treatment than a vaginal Cesarean section. I know this will meet with some criticism; but it unquestionably requires less skilled assistance for the proper performance of an abdominal Cesarean section than for a vaginal.

DR. WILMER KRUSEN.—Dr. Nicholson's remarks recall to my mind a case in which abdominal section was performed by a general surgeon when it was found that the patient was four months pregnant. The abdomen was closed, but adhesions formed. I was called to see the woman in labor. The home was a country farmhouse and two physicians had attempted to deliver the woman. I made an unsuccessful attempt to de-

liver with forceps; uterine rupture threatened. Then, with the assistance of the help that I had, I opened the abdomen and although the child was dead, I believe I saved the mother's life by this procedure rather than by doing a prolonged operation through the vagina.

DR. H. D. BEYEA.—Looking over the histories of 18 cases of Cesarean section in which ventrosuspension had been performed, I found that nearly all occurred before the period of 1896, when the operators throughout this country and Germany did what we now call ventrofixation. The operation of ventrosuspension has been credited with this. In nearly all of the other cases no statement was made as to when operation was performed, or whether the fixation caused such obstruction to labor that Cesarean section was necessary. I would like to ask Dr. Clark if he has had any such case following suspension.

DR. JOHN G. CLARK.—Williams reported a Cesarean section incident to fixation, but I have not known of or seen personally a Cesarean section following a true ventrosuspension.

DR. BOYD, in closing, said: Dr. Coles favors the induction of premature labor. I feel rather skeptical about women going over time. I think it requires a very fine diagnostician to be able to tell, from the size of the baby, whether a woman is at term or still has a few weeks to go. I would not consider that wise, because we all know some women at eight months have a seven or eight pound baby, and that some women at term have a small baby. I think that would be bad obstetrics. We all know that the premature baby does not stand operative interference well. We can only measure the pelvis fairly well and get the true conjugate with satisfaction, but we cannot measure the size of the child's head. It seems to me that the wiser course might be to let the woman go to term and even subject her to Cesarean section. With the results I have secured I feel that I am justified in pursuing that course. Regarding the morbidity of my cases, I do not recall any serious complications of the puerperium. In my last case the woman had been in labor a long time and there was slight elevation of temperature, but there was no stitch-hole inflammation. She had had a ventrofixation eight years before (after the time referred to by Dr. Beyea). The uterus had been firmly fixed to the abdominal wall. I am glad to hear Dr. Nicholson speak well of Cesarean section in placenta prævia. In a paper presented upon this subject in 1900, I was pretty well criticised. It is being done to-day and it seems to me that Cesarean section has a narrow field of usefulness in this condition. I have seen three cases of Cesarean section following ventrofixation; one was Dr. Noble's case, one Dr. Ashton's, and one was my own case. Dr. Ashton's case had been operated upon by a distinguished gynecologist in this city. Dr. Noble's case died;

also Dr. Ashton's; my own case was fortunate enough to recover.

Dr. G. M. BOYD reported a case of

MENINGOCELE OF UNUSUAL SIZE.*

Dr. GEORGE ERETY SHOEMAKER reported a case of

RUPTURED EXTRAUTERINE PREGNANCY WITH AMNIOTIC
SAC INTACT.

It is not uncommon to see a specimen of early abortion with the product of conception delivered entire, the liquor amnii being still within the sac and surrounding the fetus. It is less common to see a free abdominal hemorrhage, the fetus in the sac, still surrounded by a clear fluid and the sac floating through the tubal rent.

Mrs. T., aged 31 years, had had three children, the last two and a half years ago. Her menstruation was normal in type, and she was in good health. She considered herself about six weeks pregnant, the menses having been absent a little more than that time. Two weeks before she was seen, there had been a sudden severe abdominal cramp, she thought in the uterus. Since that she had been perfectly well until March 13, when about midday she ate heartily of soup, pie and peanut candy. To this indiscretion in diet she attributed the severe abdominal pains and violent vomiting which occurred in the next six hours. During the night following there was very severe pain and weakness, for which she took eight tablets of chlorodyne, each containing one-eighth of a grain of morphine. About 8:30 on the following morning she was seen for the first time by a physician, Dr. A. E. Blackburn, who at once recognized the gravity of her condition, the pulse being small and very rapid, the pupils contracted, the mentality blunted, probably from morphine, but there was striking pallor suddenly developed in a woman of naturally ruddy complexion. Dr. Blackburn feared ruptured extra terine pregnancy and promptly summoned the writer. The diagnosis was confirmed, the patient removed to a private room in the Presbyterian Hospital, and laparotomy immediately performed.

A short median incision developed large quantities of bright blood followed by soft black clots. Free hemorrhage was going on from the loose fronds of placenta which protruded from a rupture in the right tube. The tubal sac was about three inches in length and about one and a half in diameter. Alongside the placental fronds there floated from the sac opening a beautiful transparent membrane containing the fetus and liquor amnii, the latter perfectly clear. The specimen shows the sac still unruptured. The fetus was a little more than an

*See original article, page 184.

inch in length. The diseased tube was tied off and its corresponding ovary allowed to remain. Copious irrigation for the removal of blood. The time of operation was twelve minutes to the beginning of suturing and twenty-one minutes to the end of the same. Though the patient was in collapse with a pulse of 160 when the operation was begun, she made a complete and aseptic recovery, leaving the Hospital in four weeks.

An interesting feature of this operation was that when this patient's husband, a stranger in his locality, called up the Telephone Information Bureau, he had the good fortune to be referred to a physician, who was able to recognize extrauterine pregnancy in spite of the complication of the diagnosis by acute indigestion and vomiting produced by improper food.

DR. WILMER KRUSEN showed a specimen of

UNRUPTURED ECTOPIC GESTATION SAC.

Operation was performed three hours after the diagnosis was made, and before the tube had ruptured. The patient was aged 39 and had the history of eleven years of sterility. She made an excellent recovery.

CORRESPONDENCE.

REPAIR OF CERVIX AND PERINEUM DURING THE PUERPERIUM.

*To the Editor of the AMERICAN JOURNAL OF OBSTETRICS AND
DISEASES OF WOMEN AND CHILDREN:*

MY DEAR DOCTOR: For a number of years I have thought about the possibility of doing the "secondary operation" upon the cervix and perineum during the puerperium. It has been my habit during this time in my service as Obstetrician to the Brooklyn Hospital to repair the recent lacerations at about forty-eight hours after delivery. This procedure was set forth in a brief paper published in the *Philadelphia Medical Journal* several years ago. The favorable results from these operations suggested to me to do the secondary operations. So far as I am aware, no cases of this character have been reported. I send you the report of thirteen cases, operations done by myself, my associate and my house obstetrician. I am indebted to my associate, Dr. A. A. Hussey, for carefully examining each case before dismissal from the Maternity and for preparing the report of the cases. Case Number 12 was operated upon by him.

My thought in instituting this operation was that if it could be successfully done a great service would be rendered to the class of women who come to the maternity for confinement. They are not able to spare the time from their homes to have it done in the usual way, and so they are ordinarily neglected, and in the course of years come to suffer the serious consequences of these neglected lacerations. Having the operation done during the puerperium they remain in the hospital only a few days longer than is usual after delivery, and they go home in as good condition as if they had come for the special purpose of having trachelorrhaphy and perineorrhaphy performed. As will be seen by the reports subjoined, the results were very satisfactory; there was no interference with the puerperium. The number of cases is small, but I think is sufficient to establish the principle.

Yours very truly,

FRANCIS H. STUART, A.M., M.D.,
Obstetrician to the Brooklyn Hospital.

CASE I.—Mrs. C. U., age 37, U. S., VII-gravida. Old laceration of perineum. Delivered Nov. 23, '05. Operated upon Nov. 27. Slight old laceration of cervix. Extensive old laceration of perineum, extending into both sulci—deeper on right. Regular Emmet denudation; edges approximated with chromicized gut. Puerperium normal. Temperature never above 98.8°. Examination fourteen days after operation showed good union of perineum and cervix. Operation by Dr. Stuart.

CASE II.—Mrs. J. J., age 19, colored, II-gravida. Old laceration of perineum and laceration of cervix on right. Delivered Nov. 28, '05, sustaining fresh laceration of perineum extending up left vaginal sulcus.

Operation Dec. 1. Mucous membrane denuded from tear of cervix and edges approximated with five chromicized gut sutures; mucous membrane removed over old laceration of perineum and edges of new laceration freshened. Then three internal and five external sutures of chromicized gut used to unite edges. Puerperium normal in every respect. Highest temperature, 98.6°.

Examination Dec. 14, '05. Perineum healed, good union; cervix healed; perfect union. Operation by Dr. Stuart.

CASE III.—F. Z., age 31, Russian, III-gravida. Old laceration of perineum. Delivered Nov. 24, '05; no fresh tear of perineum. Operation Nov. 27. Old tear of cervix on left extending to fornix denuded and united with chromicized sutures (four). Emmet denudation of perineum; chromicized gut sutures.

Puerperium normal; no temperature.

Examination Dec. 11, '05: Perineum healed, primary union,

good result; cervix healed, good result. Operation by Dr. Stuart.

Discharged, well, Dec. 12.

CASE IV.—Mrs. D. H., age 24, U. S., II-gravida. Slight old laceration of perineum; slight old laceration of cervix.

Delivered Dec. 10, '05; slight fresh tear through fourchette.

Operation Dec. 12. Ragged bilateral tear of cervix, edges freshened and sutured with chromicized gut, four on right and three on left. Perineum denuded over old laceration and sutured with chromicized gut.

Puerperium normal, no temperature, in fact, b.i.d. chart shows line below 98.3°.

Examination Dec. 12: Perineum healed, primary union, result good; cervix healed. Operation by Dr. Stuart.

Discharged, well, Dec. 12.

CASE VI.—Mrs. M. H., German, IV-gravida. Delivered Jan. 12, '06, labor 20½ hours.

Operation, Jan. 15. Old laceration of cervix denuded and sutured with chromicized gut sutures on each side.

Perineum: Emmet denudation, chromicized gut sutures.

Puerperium: Temperature went up to 99.4° day after operation; came down on following day and remained normal. Fundus uteri went up two inches day after operation; came down slowly. Involution slower than normal.

Examination Jan. 30: Cervix and perineum healed, good results.

Discharged, well, Jan. 30. Operation by Dr. Stuart.

CASE V.—Mrs. C. J., age 37, U. S., VII-gravida. Old laceration of cervix and perineum. Delivered Jan. 2, '06, labor ten hours.

Operation. Cervix, bilateral denudation, edges approximated with three chromicized gut sutures on right and four on left. Perineum, old laceration extending into right sulcus with formation of pocket, Emmet denudation, pocket closed with tier sutures, buried, chromicized gut; five external sutures of chromicized gut.

Puerperium: Highest temperature, 99°, reached on third day after operation; came to normal on fourth day and remained normal. Fundus uteri went up two inches on day after operation; came down quickly, being two inches above symphysis on ninth day after operation, eleventh day after labor.

Examination Jan. 16: Perineum healed, good union; cervix healed. Uterus retroflexed and retroverted; well involuted.

Discharged Jan. 16, well. Operation by Dr. Stuart.

CASE VII.—A. L., age 27, U. S., III-gravida. Old laceration of cervix and perineum. Delivered Jan. 23, '06. No fresh tear of perineum.

Operation Jan. 25. Bilateral laceration of cervix denuded

and sutured. Perineum, old laceration extending into both sulci; denuded after Emmet, sutured with chromicized gut.

Puerperium: Highest temperature after operation, 98.8° on the third day. Fundus uteri remained at five inches for two days after operation, then came down quickly; not felt on eighth day.

Examination on Feb. 6 showed perineum two-thirds healed on skin surface; upper stitches cut through shallow pocket in right sulcus. Cervix healed, good union. Operation by Dr. Stuart.

Discharged Feb. 6, well.

CASE VIII.—N. B., age 32, Ire., II-gravida. Delivered Jan. 25, '06; no fresh tears of perineum.

Operation Jan. 27. Cervix denuded laterally, sutured with chromicized gut. Perineum denuded posteriorly. Deep pocket closed with buried sutures of chromicized gut, skin edges approximated with chromicized gut. Flap of mucous membrane used to cover sutures, no new membrane removed.

Result, Feb. 7: Cervix healed. Perineum not restored; result unsatisfactory.

Discharged, Feb. 7, well.

Puerperium normal; highest temperature, 99.6° fourth day after operation. Fundus not felt on sixth day after operation.

Operation by Dr. Stuart (modified flap-splitting operation).

Would not regular Emmet operation have given a better result?

CASE IX.—P. S., age 31, Swede, III-gravida. Old laceration of perineum and cervix. Delivered after normal labor of eight hours on Feb. 21. No fresh tear.

Operation Feb. 23. Edges of old cervical laceration freshened with scissors and curette, approximated with chromicized gut.

Perineum: Emmet operation, butterfly denudation, internal and external sutures of chromicized gut.

Puerperium normal, highest temperature, 98.8° . Fundus uteri came down normally, not felt on eleventh day after operation.

Result: Examination on March 8, thirteen days after operation, showed perineum healed, perfect union of wounded edges; cervix well involuted, good union. Operation by Dr. Stuart.

Discharged March 8, well.

CASE X.—M. D., aged 29, II-gravida. Old laceration of perineum and cervix. Delivered Feb. 25, after normal labor of eight hours. No fresh laceration of perineum.

Operation March 1, fourth day after labor. Old laceration of left side of cervix denuded with scissors and sutured with chromicized gut.

Perineum: Old laceration running into both sulci, deeper on left. Emmet denudation; angles closed with chromicized gut; deep sutures approximated with one figure-of-eight silkworm

gut suture; external sutures of chromicized gut and crown suture of chromicized gut.

Puerperium normal. Temperature of 100.8° on tenth day after operation, due to intestinal disturbance. Normal on following day. Fundus uteri not felt after sixth day.

Result: Normal restoration of parts by primary union. Operation by Dr. Rose.

CASE XI.—H. J., U. S., age 17, II-gravida. Old laceration of cervix and perineum. Delivered March 5, after normal labor of four hours; no fresh tears of perineum. Repaired March 7. Cervix: bilateral tear, deeper on right, denuded with scissors and curette; sutured with chromicized gut.

Perineum: Tear into both sulci, more extensive on left, slight on right, denudation. Angles closed with chromicized gut, cross figure-of-eight silkworm gut, pulling deep structures together. External sutures of chromicized gut, crown suture of chromicized gut.

Puerperium: Temperature normal till seventh day after operation, when it went to 99.4° ; 100.4° on the eighth; 101.6° on the tenth. Examination of perineum showed stitch abscess along course of figure-of-eight silkworm gut suture. This suture removed, good drainage established. Temperature came to normal second day after this and remained normal.

Fundus uteri came down to $2\frac{1}{2}$ inches on sixth day after operation; then gradually to $5\frac{1}{2}$ inches on the tenth day after operation; then came down quickly, and on March 21 was at symphysis, in normal position and freely movable.

Result, March 21: Cervix healed, good result. Perineum healed one-third, result unsatisfactory. Operation by Dr. Rose.

Discharged March 21, well.

CASE XII.—A. F., age 24, German, II-gravida. Old laceration of perineum. Delivered March 15, after normal labor of three hours, no fresh tear.

Operation on Feb. 5. Moderate old laceration extending into both sulci, moderate rectocele, Emmet denudation; chromicized gut sutures internally and externally; crown suture.

Result, April 2: Union primary, approximation good; two-finger os. vaginae; result very satisfactory.

Puerperium normal; highest temperature, 99.4° on day following operation. Fundus uteri came down quickly, not felt on eighth day after labor. Operation by Dr. Hussey.

Discharged, well, April 2.

CASE XIII.—H. W., age 25, Swede, III-gravida. Old laceration of perineum. Delivered March 8, after normal labor of eleven hours. Fresh tear of perineum in center, slight.

Operation March 10. Mucous membrane denuded on old scar; one chromicized gut suture on each side internally. Crown suture and three external sutures, all chromicized gut.

Puerperium: Temperature went to 100.8° on second day fol-

lowing operation; came to normal next day and remained normal. Fundus uteri came down slowly; not felt on twelfth day after labor.

Result: Perineum healed, primary union, good restoration of parts. Discharged, well, March 26. Temperature due to intestinal toxemia; relieved by cathartic. Operation by Dr. Rose.

REVIEWS.

ATMOKAUSIS UND ZESTOKAUSIS, die Behandlung mit hochgespannten wasserdampf in der Gynäkologie. (Atmokaussis and Zestokaussis, the use of steam under high pressure in gynecology). Von LUDWIG PINCUS. Zweite neu bearbeitete auflage; mit 33 figuren in text und tafeln. J. F. Bergman, Wiesbaden, 1906. 371 pages.

In the three and one-half years intervening between the appearance of the first and second editions of this treatise, the method modified and popularized by the author has had extensive trial, and with certain qualifications a considerable degree of acceptance. The value, indications and technique have been fairly well determined and it has taken its definite place in gynecological therapy. We doubt, therefore, the necessity of the extensive argumentation and polemic such as the author has introduced into this extensive volume. In the earlier edition, when the method was still fighting for its existence, the use of his polemic was in a measure justified, but it is hardly reasonable, at the present stage, to ask the reader to wade through pages and pages of argumentation on points whose value has already been definitely settled. We believe the value of the work, both as one of reference and as a popularizing measure, would be greatly enhanced by the elimination of this matter in subsequent editions. The chapters on atmokaussis and zestokaussis in general surgery and rhinology have wisely been omitted from this edition.

It may be unnecessary to repeat that by atmokaussis Pincus refers to the introduction of steam under pressure into the uterine cavity, and by zestokaussis to the heating of intra-uterine instruments for purposes of mild cauterization. Their main indication is for the relief and prevention of severe intra-uterine hemorrhages. Considerable space is devoted to a detailed description and discussion of the methods of handling the instruments and of the errors to be avoided. Equally detailed is the description of the conditions in which the method is of use. Atmokaussis is a sovereign remedy in preclimacteric hemorrhages, hemophilia, hemorrhagic endometritis and in fibroid uterus (unless the fibroids are submucous or the uterine cavity is much distorted). The author advises that atmokaussis

should be preceded by a curettage, sufficient time, however, being allowed to elapse for regeneration to take place. *Atmokaussis* is also of use in hemorrhages due to post-abortive atony, hemorrhages in the later stages of the puerperium, and as a palliative in inoperable carcinoma of the uterine body. In all other malignant conditions it is absolutely contraindicated.

In chronic gonorrheal endometritis, in tubercular endometritis, infected abortions, etc., *atmokaussis* finds but a limited application. *Zestokaussis* may be used with advantage in dysmenorrhea membranacea and to cauterize the cervix or the uterine ends of the tubes. Repeated *atmokaussis* may be required to cure stubborn cases or to induce obliteration of the mucous membrane, if this be desired. The method has the advantages of not requiring anesthesia, and of comparative harmlessness if used with caution. The author strongly deprecates the inference that these methods are "cure-alls," and emphasizes the necessity of a proper selection of the cases and a thorough working knowledge of the technique. The method is based upon painstaking and careful study—experimental, clinical and pathological—and has successfully withstood the criticism of its enemies and the over-praise of its too zealous friends.

LE DIAGNOSTIC DE LA GROSSESSE, par Le DR. L. BOUCHACOURT. Ancien Chef de Clinique obstétricale de la Faculté de Médecine de Paris, ancien Interne des Hôpitaux de Paris (Maternités de Beaujon et de Cochin) et de la Maternité. Preface de M. le DR. BONNAIRE, Professeur agrégé à la Faculté de Médecine de Paris, accoucheur de l'Hôpital Lariboisière Président de la Société d'Obstétrique de Paris. Paris. Librairie J. B. Baillière et fils, 1906. 287 pages.

The subject dealt with in this volume is discussed under eleven main headings, after a short introduction which contains an interesting and instructive discussion of human nature as found in pregnant women. There is a short chapter on the importance of rendering a positive diagnosis, including the medicolegal aspects. This is followed by a long chapter on the general symptoms and physical signs of pregnancy. For this purpose the author divides the period into the first, second and third three months. The author next turns to a discussion of the errors which may result from misinterpretation of these symptoms and physical signs and the difficulties involved in the diagnosis. The next chapter on the differential diagnosis of pregnancy is discussed along well recognized lines. This is again followed by chapters on the determination of the age of the fetus and the probable date of confinement, the diagnosis of pregnancy where the fetus is dead, the diagnosis of multiple and of molar pregnancy. The work concludes with a

short chapter containing illustrations of pregnancy as found in art.

In a discussion of such a well-threshed subject as that of the diagnosis of pregnancy, we cannot expect much that is new or original. The main desiderata of such a work are, therefore, that it be sufficiently complete and that the doctrines be sound and properly proportioned. These we believe this volume of Bouchacourt undoubtedly attains. The work is rendered additionally valuable by the concise and systematic elucidation and the numerous references to the current literature. The work is interestingly written and in an easy, graceful style.

E. M.

MÉMOIRES ET LEÇONS D'OBSTÉTRIQUE par le DR. P. PUECH, Professeur agrégé à la Faculté de Médecine de Montpellier. Montpellier, Coulet et fils; 1905. Pages 466.

The work is a compilation of 27 studies that have been published by the author in various French journals since 1890. Some of the earlier articles, such as that "On the Prevention of Gonorrheal Ophthalmia in the Newly Born" and "Curettage as a Method of Inducing Abortion," appear at present to be rather out of date, and we doubt, therefore, the advisability of incorporating such papers in an up-to-date work. Some of the more recent studies, however, are of much interest. For instance, the opening article, on "Grossesse Angulaire," is a very complete and systematic study of the frequently overlooked entity which, with us, passes under the name of "interstitial" pregnancy. The peculiarity of this form of pregnancy consists in the fact that only that horn of the uterus in which the ovum lies participates in the increase in size, whereas the main body of the uterus remains inactive. On vaginal examination, it may therefore simulate ectopic pregnancy very closely, and this diagnosis is further abetted by the symptoms of pain and hemorrhage with which "grossesse angulaire" is usually attended. In many cases abortion results and the author is firmly convinced that many abortions of unexplained origin are due to this condition. There is also a long study on "Wounds of the Uterus from External Causes" that is full of interesting casuistic material. In this and some of the other studies, all of which were published between 1895 and 1899, we do not believe that the author would advocate at the present day (in the instances where the Porro operation is necessary) formation of an external stump. In the study on "The Spontaneous Rupture of the Membranes," the causes of premature rupture are discussed very fully; the author emphasizes the necessity of prolonging the onset of labor as much as possible, especially around the period when the viability of the child comes into question. Each day saved in such an emergency is of positive value, and the author cites a case in which, at the seventh month, the onset was prolonged for nine days, permitting the birth

of a viable child. Of the other more important studies we may mention Fibroids During Labor and Pregnancy, The Influence of the Kyphotic Pelvis on Pregnancy, the Relation of Intercurrent Diseases to Pregnancy, Hemorrhage from Placenta Prævia or a Placenta Normally Situated, Ovarian Cysts and Pregnancy, Syphilitic Cervix as a Cause of Dystocia, and Spinal Anesthesia and Pregnancy. The author does not approve of the latter procedure. A good proportion of the other articles are casuistic.

E. M.

THE OPERATIVE TREATMENT OF PROLAPSE AND RETROVERSION OF THE UTERUS. By J. INGLIS PARSONS, M.D., M.R.C.P., M.R.C.S., Physician to the Chelsea Hospital for Women; Late Surgeon Royal Maternity Charity, etc. Pp. 90, with 16 engravings and 12 plates. London: John Bale, Sons & Danielsson, Ltd., 1906.

The first part of this little volume, after describing the anatomy of the pelvis in relation to prolapse, gives the etiology, pathological anatomy, symptoms, and treatment of the condition. Besides the ordinary medical, mechanical, and surgical treatment, the author presents his own operation of injecting a solution of quinine into the broad ligaments, thus producing an effusion, which later becomes organized into fibrous tissue, giving the uterus a firm support. The technique is fully and clearly described and well illustrated. The advantages claimed are no after-pains, no loss of blood, no shock, and the use of an anesthetic for only five or ten minutes. No abnormal relations are created and the uterus can easily expand in case of pregnancy. The author cites the results of 105 cases upon which he has operated, 75 per cent. of which were successful, while in only 5 per cent. did the complete prolapse recur, a most creditable record. In about 17 per cent. there was a reactionary rise of temperature to from 100° to 103° F., lasting from one to several days, but there were rarely any symptoms of cinchonism. In the treatment of retroversion and retroflexion the author purposely omits many procedures, discussing only those which have given him the best results. The book has been written to name and describe what the author considers the best methods from his own personal experience. Aside from his operation for prolapse, there is little that is not found in the general textbooks on gynecology.

P. V. K. J.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

The Syncytium.—Cyrille Jeannin (*La Presse méd.*, May 26, 1906), defines the syncytium as the epithelial covering of the chorionic villi. It consists of a layer of granular protoplasm covering the cells of Langhans, which easily takes staining materials. It is rich in chromatin nodules and these cells are grouped irregularly. The surface of this layer is irregular and covered with projections of newly formed tissue. During the first months of pregnancy it is thick and growing, while as pregnancy progresses it becomes more and more flattened, and at term forms only a thin layer. The tissues of the syncytium penetrate the maternal tissues, first the decidua, then the uterine muscle, and are found in the veins of the serotina and all the villi of the chorion, while fragments separated enter the circulation and are carried to the viscera. The Langhans cells and the syncytium both derive their origin from the fetus, forming a sort of ectoplacenta. As to its physiological rôle it is admitted that the ovum enters the uterine mucosa by means of the histological properties of the syncytium, which destroys the maternal elements. The chorionic villi burrow actual canals into the thickness of the serotina, and thus are formed the lacunar spaces in the decidua. The absence of division of the syncytium into cells facilitates the exchanges of materials between fetus and mother: it acts not as a simple filter but as a glandular organ, and may be compared to the kidney, which is at the same time a filter and a gland. The syncytium also affects the products of the fetal life and passes them along into the maternal circulation. It acts on the maternal blood, carrying nourishment from it to the fetus. Later it modifies the substances which pass from mother to child by a diastatic action, playing the part of the enzymes. There is no doubt of the existence of a proteolytic ferment in the secretion of the placenta; perhaps of fat, lactic, and glycogenic ferments. The placenta possesses an internal secretion which acts through the syncytium. This secretion may act on the fetus through the whole of pregnancy, ceasing at birth. Other authors believe that this secretion produces many of the phenomena of pregnancy, such as vomiting, chloasma, and changes in the hairy system. The presence of syncytial elements in the blood determines the formation of a special cytotoxin. The syncytium lends to the placenta the character of a true vascular blood gland. Pathologically the syncytium forms the principal element of the hydatid mole which is the result of the proliferation of the epithelium of the chorionic villi. The cells of Langhans in

several layers are covered with a layer of syncitium, forming small pedunculated or sessile vegetations, which become cysts by vacuolization. It degenerates toward the form of the deciduoma malignum, in which we have a lacunar tumor formed by the multiplication of the masses of the syncitium. These multiply, emigrate, and form new growths in other organs, the metastases of the chorio-epithelioma. These secondary tumors occur in vagina, or ovaries, lungs, liver, brain, etc. There is a discussion at present of the rôle played by the syncitium in producing eclampsia, which is of great interest. It is possible that insufficiency of its function allows of the passage of poisons from fetus to mother. The elements of the syncitium are also found in teratomata entirely independent of pregnancy, in both sexes.

Tumors of the Placenta.—V. Pitha (*Ann. de Gyn. et d'Obst.*, April, 1906), describes a tumor of the placenta observed and examined by him, together with two other specimens. He has collected from literature 61 other cases of tumors of the placenta, described by various authors under different names. He considers that they all belonged to the same category as his own case. These tumors he believes to be anomalies of development of the vessels of the chorionic villi, resulting in increase of the capillary elements as well as of the embryonic connective tissue of the villi: thus they may be called chorio-angiomata. Their relation to the constituent parts of the placenta is of the utmost importance; the tumor is found located in a true envelope. In most cases it is described as situated between the fetal surface of the placenta and the uterine wall, and in the substance of the placenta. Between the tumor and the uterine wall there is a layer of decidual tissue, hence they cannot grow from the uterine muscle. Vessels can be traced directly from the cord to the tumor, and the tissue is derived from the *chorion frondosum*. The tumor is easily removed from its bed, is generally lobular, of reddish color, and never more than half the size of the placenta, often much smaller. The growth is limited; its development is determined by the length of pregnancy, and is always slow. The tumor grows with the other parts of the placenta. In consistence it is somewhat fibrous, and it contains many engorged capillaries. It may be pigmented from necrosis and deposition of blood pigment. Its envelope is similar to that of the chorionic villi. These characteristics, which are common to all that have been described, show that we have to do with a lesion of the chorionic villi. Such tumors have been called organized hemorrhages, false umbilical nodosities, etc. Most authors believe that they are dealing with true tumors of the placenta, of structure foreign to the organ. The author considers them neither true tumors nor hypertrophies. They never take on a malignant form and never displace entirely the placenta, there being always enough placental tissue left to nourish the fetus to term. The tumor

is always formed of the elements of the villi, a layer of Langhans' cells, one of fibers parallel to the surface, and a layer of capillaries. This structure is sufficient to demonstrate that they are due to changes in the development of the vessels of the chorion, are products of the transformation of the villi themselves, true chorio-angiomata.

Effect of Roentgen Rays on the Ovaries in Pregnancy.—Ottfried Fellner and Friedrich Neumann (*Zent. f. Gyn.*, June 2, 1906), give the results of their study of the effects of the x-rays in pregnant animals. They find a degeneration of the parenchyma as well as of the ova in the ovary, due to the rays, so that the function of ovulation is held in abeyance. There is at the same time a retrograde process in the fetus. The authors believe that these facts may be made use of in the treatment of the human race. In cases of osteomalacia they will be useful, since here there is an increase of the internal secretion of the ovaries. The hemorrhage of myomata preceding the climacterium may be benefited by hastening the menopause. Abortion may also be produced in this way. It may be made use of in sterilization of women who for any reason ought not to become pregnant. All these conditions should be studied in the light of these demonstrated changes due to the x-rays.

Dietetic Treatment of Vomiting of Pregnancy.—Louis Koliński (*N. Y. Med. Jour.*, June 9), concludes that the vomiting in hyperemesis is a reflex act started by the ingesta or by motion, and that the speed and ease with which everything is expelled is facilitated by its lightness and fluidity. This hyperesthesia of the organ is not due to any organic disease of its structure, and one cannot assume that the act of digestion is in itself retarded or arrested. The ingesta, if they excite emesis, arouse and perpetuate the vomiting. The writer has planned a diet of substances limited in number and of such physical structure, that, through their density and heaviness, ejection from the stomach is well-nigh impossible. Of proper foods, pork, ham, and bacon are first, and should at least be the first food taken each day until the cure is complete. Following the daily breakfast of pork in some form, with cocoa, chocolate, and corn-bread, a dinner of beefsteak, roast or corned beef with rice, potatoes, spinach, cauliflower, kale, or turnips is offered. Fish, game, fowl, and cheese may also be suggested. Foods which induce vomiting are water taken freely, milk, tea, coffee, soups, and all kinds of fluids—neutral acid and saccharine, custards, eggs, toast, and fruit. The most unstable dietetic combination is toast, eggs, and tea.

Etiology and Therapeutics of Vomiting of Pregnancy.—Arthur Müller (*Zent. f. Gyn.*, April, 1906), believes that in many cases hyperemesis is the result of a reflex neurosis of the sympathetic, due to catching of or pressure on nerve fibers from an inflammatory process or congestion of the uterus. The seat of this

lesion is variable. It may be in the upper portion of the fundus, near the promontory, or in the neighborhood of the solar ganglion. After adhesions are destroyed the vomiting often ceases. Parametritis posterior with pathological ante flexion and hardening of the cervix, or fixed retroflexion may cause irritation. Or the source may be near the internal os. According to some, adhesion of the placenta of pathological nature may cause vomiting. Disease of the adnexa may be responsible for irritation. The principal remedies are massage, stretching of the ligaments, reposition of the uterus, tamponade of the cervix, hot douches, injections, and sitz baths. The predisposing cause may be hysteria, neurasthenia, intestinal intoxication, or liver troubles. The removal of the ovum is necessary in some cases. Reflex sympathetic irritation combined with intestinal intoxication seems to account for most cases of hyperemesis.

Natural Uterine Efforts in Parturition.—Alvah N. Collins (*Phys. and Surg.*, May), advises against the too ready application of forceps. The time required to bring about the proper condition of the cervix and lower uterine segment is variable, and this time should be allowed if it is three hours or three days, there being no urgent contraindications.

Operative Therapeutics of Eclampsia.—Esch (*Münch. med. Woch.*, April 10, 1906) compares the statistics obtained from the treatment of 79 cases at the clinic for women of the University of Berlin with interference undertaken early, with those of 79 other cases treated under the expectant plan. From a comparison of the results he shows that the mortalities of the two methods of treatment differ very slightly. From expectant treatment he obtains the percentage of only 7.7 per cent. mortality. Ohlshausen, as early as 1892, gave us the dictum that in eclampsia the labor should be terminated as early as possible, while every operation should be undertaken under complete narcosis so as not to cause fresh reflex irritation. As a result of early termination of labor we find that in three-quarters of the cases there is no eclamptic attack after labor is complete. The mortality after operation is much less than after unaided delivery. There is a greater mortality among primiparæ, in whom the labor is generally long. After labor the consciousness of the patient quickly returns, the eye symptoms vanish, edema decreases, diuresis is soon established, and albumin rapidly disappears. The rapid delivery method is to be used only in selected cases, and not every case that comes to us requires a severe operation. There are different grades of poisoning. In the lighter forms the expectant treatment will give good results, while in severe forms it would end in a fatal issue. In such cases whatever operation is likely to save life should be at once performed. The severity of the poisoning is to be judged by the effect on the pulse and temperature as well as upon the condition of the sensorium. In appropriate cases version is indicated; with dead children perforation is in order.

Plastic Operation on the Pelvis.—B. Crédé (*Zent. f. Gyn.*, June 2, 1906) proposes an operation for permanent enlargement of the pelvis, which is to be done preferably when a woman with a contracted pelvis marries or when it is found that she is pregnant, and not just before labor. The operation must be easy and without danger in such cases. The author performed it in one patient six weeks before labor, with the result that a living child was delivered with ease and the puerperium was uneventful. If hebotomy is done there is no permanent benefit, but after the writer's operation any following pregnancy is made ready for. The operation is most easily done on the left side, but in much contracted pelvises it may be done on both sides at the same time. The operation increases the width of the pelvis 2-3 cm., and the increase is maintained by the introduction into the space formed of a piece of bone obtained from the pubes, which is moved over into the cavity and retained there so as to unite with the two portions of the ramus that have been sawed through. Absolute asepsis is obtained by introducing into the wound two or three leaves of collargol, and covering it with sterilized cotton. Only the external dressing need be removed daily. The elliptical incision in the skin begins one centimeter outside of the right tubercle of the pubes, crosses the rectus muscle to beyond the left tubercle, one centimeter below the crest of the ilium, and is 10 to 12 centimeters long. It is deep enough to allow the finger to pass into the foramen ovale. In front of the pubes the pectineus and obturator externus are freed from the bone. A Döderlein needle is introduced, followed by the chain saw, and the pubes is divided as in hebotomy. Later the saw is introduced through the fossa ovalis, and the bone is sawed from within into the first incision, so as to remove a triangular piece of bone, which is moved into the space made by stretching the pelvic segments as far apart as the wound permits, first sawing through the ramus a little to the left of the first line of division. Care must be taken that the circulatory connections of this piece of bone are not severed, so that its union may not be endangered. It is retained in place by two catgut sutures. The conjugata vera will be increased 1-1.5 centimeters. Two rubber drains are left in place for the first 4-8 days, the secretion coming mostly from the upper wound. Union by first intention should take place under the first dressing.

GYNECOLOGY AND ABDOMINAL SURGERY.

Leukoplakia of Vulva, Vagina, and Uterus.—F. Jayle and X. Bender (*La Presse méd.*, April 21, 1906), describe leukoplakia as occurring, with variable frequency, on the mucous membrane of the vulva, vagina, cervix, and uterine lining. In the last location it occurs when the nature of the epithelium has been so changed by disease or treatment as to become pavement epithe-

lium. In whatever location, it presents the same macroscopic appearance, that of irregular patches of grayish-white or silver nitrate color. The patches may be single or multiple. They are always adherent, and when of some duration look like white cheese, the surface being rough, hard, and dry. Histologically there are three essential features: hyperacanthosis, hyperkeratosis, and hypergranulation. One or other of these features may be absent, according to the age of the patch. It often degenerates into cancer, and every such patch should be removed on account of this tendency to become malignant. It is most frequent in the vulva, over the labia, and clitoris. The symptoms are slight, consisting principally of pruritus; often there are none at all. When the patches become fissured there is pain. The disease is chronic and progressive, lasting for years. Treatment consists of asepsis, but removal of the patch is generally necessary. It is very rare in the vagina, and still more so in the uterus.

Osteomalacia Cured by Producing Atrophy of the Ovaries by the X-rays.—Ascarelli (*La Rif. med.*, May 26, 1906) has treated a severe case of osteomalacia by the x-rays, in order to produce atrophy of the ovaries. Since it has been established that both ovaries and testicles are sterilized by the rays, this seemed a feasible method of treatment. In a case which was treated for five months by this method he obtained these results: after two months' treatment the patient began to improve, while the menstruation became abundant, irregular, and painful. At the end of five months she was cured and menstruation had ceased. Five months had elapsed since the cure and there had been no return of the symptoms and no reappearance of menstruation.

The Relations between the Menstrual Function and Mental Disease.—Aleardo Salerni (*Il Policlin.*, May, 1906), recalls the fact that even in normal women the menstrual period is accompanied by many nervous symptoms, and only in rare cases is the advent of the period unaccompanied by symptoms. Irregularity of menstruation commences generally at the same time that a morbid mental state begins, and continues throughout the duration of the mental trouble. When menstruation becomes regular again it indicates the return of physical health, and in this way only is a prognostic feature. Amenorrhea and menorrhagia are the most frequent alterations of function. In cases of periodic mental disease and of arrest of development the beginning of the menstruation is always accompanied by agitation, which continues as long as the flow lasts. A causal relationship between mental disease and these alterations of the menstrual function is somewhat rare, and there are usually other etiological factors present; but menstruation has a marked influence on the course of the mental diseases. Menstruation is generally irregular in all varieties of mental disease, and those varieties are coincident with the psychoses without being their

cause. Most forms of mental disease are worse at the menstrual period, but there is no special type of symptom shown during the exacerbation. In the periodic forms the relation to the menstrual period is marked and they often begin at the menstrual period. The chronic mental diseases are rarely accompanied by menstrual irregularities. Toxi-infective forms are most affected by menstrual irregularities. In cases of arrest of development the regularity of menstruation is in direct relation with the condition of physical development.

Surgical Treatment of Tuberculous Peritonitis.—A. Broca (*Ann. de Gyn. et d'Obst.*, April, 1906), discusses the surgical treatment of tuberculous peritonitis. He concludes that in certain forms of tuberculous peritonitis there are indications for laparotomy, but that this is not applicable in all cases, for the reason that many cases are cured by merely medical means, while others are not benefited by any form of treatment, whether medical or surgical, inevitably leading to a fatal issue. We should distinguish two kinds of lesions: first, those in which the peritoneum alone is involved; second, those in which there is a generalized infection—acute, subacute, or chronic. Fever may not be an indication of a fatal lesion, but when with fever we have a generalized infection it is best to refrain from operating. When there is a slight lung lesion this need not be considered a contraindication to operation for tuberculous disease of the peritoneum. When we find inflammatory reaction with formation of fibrous tissue and production of ascites this may be regarded as an attempt by nature to react against the bacilli. Laparotomy and the introduction of air into the peritoneal cavity will often result in the drying up of the ascites and ultimate recovery. At the same time many such cases recover under medical treatment. Hence we conclude that in cases of ascites we need not hasten to operate, but should endeavor first by other means to facilitate the absorption of the ascitic fluid. Laparotomy is of value when the lesions are old but have not yet become caseous, but in young tubercles it does not bring about regression. The laparotomy hastens fibrous formation in old lesions and prevents caseation. In cases in which the ascites disappears but the abdominal lymph nodes become caseous, operation is useless. The condition may simulate appendicitis, and here operation does no good, but general treatment is of more value. Many cases of ascites arise from a tuberculous affection of the ovaries. These pelvic forms are especially susceptible of cure by removal of the adnexa. Another form in which laparotomy is of value is that which is complicated by occlusion of the intestine by bands of adhesion or by agglutination. Here operation gives immediate relief of serious symptoms, and may result in a cure. The writer's final conclusion is that in certain cases of peritonitis, when medical treatment has been of no avail, and when most of the

viscera are intact, operation is indicated. Recurrences are not rare after operation, in whatever form it is used. Surgical interference is not indicated in nearly all cases seen by the physician.

The Peritoneum in Abdominal Surgery. Albert J. Bouffleur (*S. Cal. Pract.*, June) believes that the varied lymphatic supply produces a variance in the behavior and manifestations of infection of the different abdominal viscera and may account for the diseases most frequently manifested in some of them. The normal peritoneum possesses marked powers of exudation and absorption, and these functions may be life-saving or death-producing according to the asepticity of the peritoneal cavity. The lower or pelvic zone is more exudative, while the upper is more absorptive; this accounts for the seriousness of infections and operations in the upper zone. In aseptic cases we can favor restoration of circulatory equilibrium by introducing fluids into the abdomen and aid its absorption by Clark's inverted position. In septic conditions we should lessen absorption, localize exudation in the lower abdomen, and provide external drainage by Fowler's sitting position and the use of large tubular drains.

Adrenalin in the Peritoneal Cavity. Emery Marvel (*Theor. Gaz.*, June) advocates the use of adrenalin in the peritoneal cavity to control peritoneal oozing. When shocks and depression exist the introduction of adrenalin diluted with normal salt solution into the peritoneal cavity is more convenient and more effectual than intravenous infusion. It also tends to prevent the formation of adhesions.

Gonorrhea in Women. Palmer Findley (*Amer. Med.*, March 17) finds that gonorrheal infection may exist in the genital tract during pregnancy without clinical manifestations and become active during the puerperium. The menstrual act may have a similar effect. Husband and wife may both have the disease and neither manifest any symptoms. The period of inoculation varies from twelve hours to a week or more. The gonococcus can infect a tissue without loss of the overlying epithelium. The surfaces of the vulva, vagina, and vaginal portion of the cervix evince a peculiar resistance to gonorrheal infection during sexual maturity. Gonorrheal urethritis, so frequently observed in acute cases, is rare in the chronic stage. In from six to ten weeks it is often possible to regard a patient as fully recovered from the urethral infection. Gonorrheal vaginitis is rare, and seldom if ever reaches the chronic stage. The uterus is a favorite site for gonorrhea and is found involved in the acute and chronic stages. It is the rule that the infection remains confined to the uterus for months before it extends to the tubes. On this account a guarded prognosis as regards the involvement of the tubes must be given. Gonorrheal ovaritis is an almost constant sequel to

tubal infection. To this infection are due a large proportion of sterile marriages, and the one-child sterility is accounted for in a large measure by extension of a gonorrhea during the puerperium. This infection has a marked influence in causing abortions; it predisposes to ectopic pregnancy and causes the infection in one case in every six of puerperal sepsis. In the treatment of the acute stage, rest is the first principle, with as little instrumental and digital interference as possible; cleanliness is essential. To keep the urethra and bladder clean, increase the amount of urine by giving large amounts of water. The vagina is best kept clean by douches of 1 or 2 per cent. lysol or a 1 to 2,000 mercuric chloride solution. No other means are to be employed in the acute vulvovaginitis. The douches should be given in the recumbent position every four to six hours. As an adjunct to the douches, glycerine and ichthyol tampons may be used daily, these being removed in four hours. To relieve pain use hot applications to the hypogastrium, sitz baths, and opium when necessary. Chronic urethritis is best treated by applications of a 20 to 50 per cent. silver nitrate solution through an endoscope. Infected follicles must be opened and cauterized. When ulcerations develop in the vagina they are best treated by the cautery. Infected Bartholinian glands must be dissected out. For chronic cervicitis the writer prefers applications of 10 to 40 per cent. formalin, and if the endometrium of the body is involved he cures and swabs out the cavity with pure formalin. When the tubes are involved, do not curette, and if they cause little or no discomfort operation is not called for; but if, on the other hand, they cause serious disturbances, they should be operated upon. Here nothing short of complete removal of tubes and uterus will promise a cure. The vaginal route is the one to be preferred in operating.

Leukocytes in Gonorrhea. From an analysis of the leukocyte count in fifty cases of gonorrheal infection in both males and females, I. S. Wile (*Amer. Jour. Med. Sci.*, June) concludes that the polymuclear neutrophils are highest in acute anterior urethritis and decrease with involvement of the posterior urethra, and are lowest in chronic gonorrhea in male or female. The mononuclear leukocytes are increased in the chronic processes and vary inversely with the polymuclear neutrophils. The basophiles are hardly affected by the disease. There is no relation between the appearance of any type of leukocyte in the blood and in the discharged pus. The eosinophiles are of no diagnostic value in gonorrhea.

Kidney Fixation. J. H. Carstens (*four. Amer. Med. Assn.*, May 12), from a series of twenty-five operations for fixation of the kidney, concludes that by proper technique movable kidneys can be permanently fixed. He believes many digestive disturbances are due to irritation of the sympathetic system, and possibly the solar plexus, caused by mova

neys. By fixation many of these symptoms will be relieved. Before operation it must be ascertained that the kidney is the cause of the trouble beyond any reasonable doubt.

Spontaneous Cure of Cancer.—Harvey R. Gaylord and George H. A. Clowes (*Surg. Gyn. and Obst.*, June) find that spontaneous cure of cancer in experimentally inoculated mice occurs in about twenty-three per cent. of the animals. The chances of spontaneous cure are inversely proportional to the size of the tumor. The frequency of this occurrence and its distribution in animals suggests that it may be more frequent in human beings than is generally supposed. The occurrence of spontaneous recovery from cancer, indicating the existence of immense forces capable of terminating the disease, demonstrates that cancer is not necessarily incurable, and should serve as an additional stimulus to research directed toward the discovery of a serotherapeutic treatment.

The Stem Pessary.—J. H. Carstens (*Lancet-Clinic*, June) finds that the stem pessary will generally cure amenorrhea after all other means have failed. It will develop an infantile uterus and enlarge a prematurely atrophied one and restore a super-involved womb to a normal condition. It will cure most cases of intractable dysmenorrhea, where no special pathologic condition can be found. If worn for six months or a year it sometimes cures sterility. All inflammatory conditions about the pelvic organs must be rigidly excluded before its use, and the same aseptic precautions should be taken during its introduction as a surgeon would with the most complicated case of abdominal surgery.

Pelvic Displacement and Pain.—W. Hey Groves (*Brist. Med.-Chir. Jour.*, June) believes the pelvic viscera are supported chiefly by the underlying pelvic floor, composed in main by the levatores ani and their investing fascia. This floor is adequately supported at its circumference but is weak in the median line; its efficiency depends upon the union of its two halves in the median line. Displacements of the uterus, bladder, and vagina, apart from diseased conditions, depend upon a rupture, stretching or thinning of this median raphé. The rational treatment of these conditions consists in a repair of this muscular raphé. The use of a pessary constitutes a reasonable second best treatment. When the pelvic viscera lose their adequate support by the pelvic floor, they hang upon their peritoneal ligaments and thus cause pain by dragging upon the ovaries, tubes, and pelvic nerves.

Nervous Troubles Following Gynecological Operations.—Otto Kaiserling (*Berl. klin. Woch.*, April 2, 1906) describes the nervous troubles following gynecological operations as seen in the Berlin Polyclinic. He classifies 28 cases seen in one year, dividing them into two categories: those in whom the first

nervous manifestations came on after the operation, and those who had nervous disturbances before the operation, which were intensified after it. The patients were of all ages, from 23 to 51 years of age. In most of these cases there is to be found a neuropathic constitutional tendency. The kind of operation has no bearing on the severity of the disturbances, a curettement having as much effect as a total extirpation. The patients complain of nervousness, unrest, lack of sleep, tremblings, paresthesiæ, apathy, neuralgias, and congestive symptoms. There is no objective disturbance to be found. The treatment of most avail is hydrotherapeutic, using whatever method will produce a good reaction in the individual patient. Hot baths with electricity or steam baths are the most useful. In some, hot packs serve better. The treatment should produce a sense of rest and quiet. In other cases half baths with friction and massage are useful. The temperature should be from 30° to 32° and be gradually reduced. It is best to change the plan of treatment often. There is a form of bath in which the patient reclines on a perforated board through which the water is slowly forced so as to stream gently about the patient. This is very effective in these cases. Carbonic acid baths are also useful. Light gymnastics which carry out gentle regular movements are a valuable aid in some cases. The diet should be most nourishing; coffee and tea should be forbidden. All the treatment should be arranged to suit each individual case. Whether gynecological treatment should be carried on at the same time must depend upon the condition of the patient and her ability to bear local treatment. If the treatment begins as soon as the nervous symptoms occur the hope of cure is good, but in old cases of long standing we can hope for only partial or temporary relief.

Primary Malignant Disease of the Vermiform Appendix.—

From an analysis of the reported cases, H. D. Rolleston and Lawrence Jones (*Amer. Jour. Med. Sci.*, June) conclude that the disease is one which renders an accurate diagnosis impossible; every case in which the symptoms drew attention to this region exactly simulated appendicitis in some form. Most of the older reputed examples fail to withstand investigation, but as 80.9 per cent. of the forty-two genuine examples have been reported since 1900, the disease cannot be quite so rare as has been thought. The microscopic size of the growth in some cases makes it probable that many such instances have been overlooked. Pathologically, several varieties of carcinoma have been reported, and also sarcoma and endothelioma. The growth is usually, however, a spheroidal-celled carcinoma, which is peculiar in the early age incidence, the slight malignancy, and the resemblance to endothelioma. Colloid change is not common, as has been hitherto supposed. The presence of concretions is mentioned in only three cases

out of forty-two. The disease is not prone to affect one sex more than the other. Inflammatory changes, either chronic or acute, very frequently accompany the growth. The immediate prognosis and the prospect of freedom from subsequent recurrence after operation are very good, particularly in spheroidal-celled carcinoma.

DISEASES OF CHILDREN.

Infantilismus with Gastrosuccorrhea of Reichmann and Tetanus.—Michele Landolfi (*La Rif. Med.*, April 21, 1906) discusses infantilismus, which he divides into two forms: the type of Lorain, which is degenerative and characterized by weakness, slender and small body, a sort of arrest of development; and that of Brissaud, in which the small stature is a fundamental characteristic, the individual being a true baby in form, with a large head and legs that are long in proportion to the trunk. The first form results in a little old man in appearance. In the Lorain form development is not arrested, as in Brissaud's form, but is delayed, the mental condition being similar to the physical. It results from various causes: infections, intoxications, organic general dystrophies, and morbid predispositions. The Brissaud form is the myxedematous type, due to an insufficiency of the thyroid, which is acquired, for were it congenital it would result in idiocy. Infections that may result in infantilismus are tuberculosis, hereditary syphilis, malaria, leprosy, erysipelas, and influenza. Intoxications by alcohol, nicotine, and lead may cause it. Cardiovascular dystrophies, pulmonary cyanotic conditions, and mitral diseases are etiological factors that may be recognized. A form of auto-intoxication that was exemplified by the author's case is that of gastrointestinal origin. The patient had gastric acidity of Reichmann's type, and from this resulted infantilismus, and by poisoning tetanic attacks were brought on.

Congenital Cystic Kidneys.—L. Emmett Holt (*Arch. of Ped.*, May) records a case of multiple abdominal tumors in a child whose abdomen was noticed at birth to be large. At the age of six months there was a large irregular mass in each lumbar region, a smooth rounded one in the right iliac region, and a small one to the left of this. At the age of three months the diagnosis of sarcoma of the kidney had been made, but with the exception of attacks of diarrhea there were no abnormal symptoms. Later the child became pale and poorly nourished, but regained its healthful appearance. He died at the age of fourteen months after an illness of two weeks with symptoms and urinary signs of pyonephrosis. The autopsy showed the tumors in the lumbar regions to be cystic kidneys, that in the right iliac region the hypertrophied bladder, and the smallest a dilated tortuous ureter.

Fetal Ichthyosis.—B. W. Moore and L. M. Warfield (*Amer. Jour. Med. Sci.*, May) report a case of fetal ichthyosis which died on the third day after birth. The child looked as though it had outgrown its skin, which showed broad, deep tears all over the body. The most striking feature was the great thickness of the horny layer. On the abdomen it was only .2 to .4 mm. thick, but on the scalp it was almost 3 mm. thick. It was made up of numerous lamellæ irregularly and regularly arranged in layers. The transition from the cells of the Malpighian to the horny layer was in general abrupt. The rete mucosum appeared to be thinned. The deep fissures included the whole of this layer down to the corium. The fissures were recent, as was shown by the absence, in many places, of epithelium in the tears. The sebaceous and sweat glands did not appear to be increased in size or number, nor was there hornification of their gland cells. The true cutis was in most places normal. The thymus showed a condition analogous to senile atrophy. Sections of the thyroid showed cellular collections separated by dense bands of fibrous tissue. No typical alveoli were present, but irregular spaces containing cells and granular material which had little resemblance to normal colloid. The alveoli were lined mostly with columnar cells with a small, round, deeply-staining nucleus near the base of the cell. A large cell with a round vesicular nucleus was also present. These cells were mixed with no regular arrangement. There was an enormous increase in the connective tissue, which showed both hyaline degeneration and young fibers. The connective tissue seemed to be compressing and causing atrophy of the gland. Welcker found in the embryos of certain of the lower animals a membrane covering the hairs. This had its origin in the epiblastic layer, and the cells composing it were large, puffed-out, so-called bladder cells. He called this membrane the epitrichium. In the human embryo he did not find this separate membrane, but a distinct layer of cells of the same general character that formed the outermost layer of the epidermis. This he considered analogous to the epitrichium, and he called it the epitrichial layer. This layer normally disappears at about the sixth month of intrauterine life. The persistence of this layer, as suggested by Bowen, might be regarded as the extrinsic cause of fetal ichthyosis. The present writers suggest that a combination of such persistence and a lesion of the thyroid causing loss of its secretion offers the best explanation of the cause of the anomaly. In the ichthyotic fetus they suppose that the membrane mentioned presents desquamation of the epidermis if any exists, while a trophic change causes excessive hornification of the rete Malpighi. The growth of the body mechanically ruptures this skin. Such rupture apparently takes place only shortly before birth, as in all reported cases there were no scabs of old healed fissures, but all were of

recent date. Cases as severe as the one reported are incompatible with life, but in the mild or even in severe cases it would seem advisable to protect the skin by means of sterile ointments and dressings and to administer thyroid extract.

Ritter's Disease, or Exfoliative Dermatitis in the New-Born.—This is an acute infection of the skin found among children during the first few weeks of their life, resulting in complete recovery within ten days or else in death. The mortality is 50 per cent. Few cases have been reported. The present instance is recorded by B. M. Baker (*N. Y. Med. Jour.*, June 9). The affection rarely appears before the end of the first week of life, usually between the second and fifth. It begins suddenly as a diffuse erythema, usually first over the lower half of the face about the mouth, thence spreading to the cheeks, forehead, and neck, then to the chest, abdomen, and extremities. It may appear in patches, begin elsewhere, or be universal. The affected skin varies from red to purplish red. After 36 to 48 hours the redness has become general and exfoliation begins upon the parts first affected. The skin wrinkles and lifts up in layers, so to speak, resembling a fish with the scales turned the wrong way. There is exfoliation of the epithelium of the nose and mouth, and the corners of the mouth are fissured. The conjunctiva is infected, with an accumulation of seropus which seals the lids. Desquamation takes place very rapidly, quickly followed by regeneration. Unless complications occur the child is virtually clean in ten days. There is no fever or systemic disturbance in the absence of complications. In severe cases a marasmic condition may rapidly supervene and cachexia may follow the disappearance of all cutaneous symptoms. Relapses, usually mild, occasionally occur ten or twelve days after the first attack. Nothing positive is known as to its causes, but the writer thinks that the occurrence of infection of the umbilical stump in his own case a few days before its onset favors the idea that the affection is pyemic. The chief diagnostic points are the age of the patient, acuteness of the attack, rapid extension, superficial seat, rapid course without pyrexia, and its characteristic desquamative features. It must be differentiated from pityriasis rubra, ordinary exfoliative dermatitis, simple erythema, hereditary syphilis, acute eczema, erysipelas, pemphigus simplex and foliaceus and the exanthemata. The treatment consists in application of a bland ointment. In the case here reported there were exuberant granulations and an infection of the stump of the cord. The eruption began on the nineteenth day, five days after the navel was healed. It ran the typical course described above, with a few bullous patches on the extremities. No microscopic examination of the discharge from the umbilical stump, bullæ or eyes was made.

! **Diagnosis and Treatment of Rickets.**—E. Perier (*Ann. de Méd. et Chir. infant.*, May 15, 1906), says that a typical case of rickets

is easily diagnosed, while one that begins late and is limited to some parts only of the bony framework is easily confounded with other complicating conditions. In a typical case before the age of walking the child has pain on movement, while after he has begun to walk he has a peculiar gait due to the deformities of the limbs. The shape of the head is peculiar, large at the top, with a small face, pointed below and with a peculiarly old look. The anterior fontanelle is large, and the bones of the head are easily depressed by the fingers. Dentition is retarded and irregular. The palatine vault is much curved, giving a high arch; the nasal fossæ are narrow and the voice nasal. The thorax is flattened above, while the abdomen is prominent. There is a rachitic rosary, with scoliosis of the spinal column and a deformed pelvis. The physician is often consulted for the complications rather than for the disease itself. Dilatation of the stomach is a frequent condition, and skin diseases are common. Stunted, pale children with irregular teeth may be suspected of rickets. Such cases as have begun in the second year show no thoracic symptoms, but the limbs are affected. The pain on movement may cause it to be considered a case of rheumatism, or the inability to walk may give the appearance of paralysis. The prophylaxis of rachitis would require a knowledge of its cause. We can, however, use hygienic measures which will be of great service in prevention of the disease. We can give food that will contain a large amount of lime. Such is mother's milk of good quality for infants under one year. In the country, where food is good, rickets is rare. When the milk is insufficient, add gruels made of white bread and milk, arrowroot, etc., and increase the amount and quality of nourishment gradually. The deformities may be lessened by keeping the child quiet on his back. Hygiene with little medicine is the curative treatment. Sea air is of especial value; sunshine and fresh air are always indicated. Sea water baths, warm at first, then given cold, are of great value, or a sojourn at springs whose waters contain chloride of sodium. Phosphorus in various forms and cod-liver oil are the best remedies. The deformities diminish after the cure of the disease, and surgical interference to correct them should not be undertaken under four years of age.

Digestion of Fat in the Infant Stomach.—J. P. Sedgwick (*Arch. of Ped.*, June), describes a number of analyses conducted for the purpose of determining the fat-splitting capability of the infantile stomach. From them he concludes that a fat-splitting ferment is present in the infant's stomach. This could be demonstrated in the first few hours in the rabbit and at least in the second week in the infant. In the infant's stomach itself the milk fat is partially split; in these experiments, from 2.9 per cent. to 10.6 per cent. After the first half hour the fat splitting increases slowly but steadily. The acids produced are mostly

higher members of the fatty-acid series and are derived, in the greater part, from the fat.

Hypertrophic Pyloric Stenosis.—In a report of a fatal case of this condition by Louis Fischer and Arnold Sturmdorf (*Arch. of Ped.*, May), one of the writers who operated upon the child, discusses the surgical treatment of such stenosis. The mortality of the recorded cases after various procedures is as follows: pylorotomy, 100 per cent.; gastroenterostomy, 66.6 per cent.; pyloroplasty, 50 per cent.; divulsion, 33.3 per cent. Divulsion and pyloroplasty yield the smallest death rate, and the reported cases in which these operations proved successful represent the youngest patients operated upon. The significance of these two points is that divulsion and pyloroplasty can be employed only in cases in which the stenosis is not so extreme as to prevent the passage of the forceps or of the knife through its lumen. When true hypertrophic stenosis has occurred, as in the author's case, where only a fine probe would pass through the pylorus, a more radical operation is necessary. The writer says that embryologic, pathologic, and clinical facts would indicate that this condition should not be interpreted as congenital and might be better termed infantile pyloric stenosis. For practical purposes, the condition should be looked upon as presenting three stages: (a) simple spasm of the pylorus; (b) spasm and hypertrophy of the pylorus; (c) tumefaction and stenosis of the pylorus. The diagnosis of the first or second stage is extremely important, as it is possible that in these stages medical and dietetic measures may be of curative value. Medical and dietetic measures should not be tried too long, and divulsion should be resorted to before the stenotic stage is reached. When the stenotic stage has developed, gastroduodenostomy, in two sittings if necessary, should be the operation of choice.

Infantile Diarrhea in Nurslings under Two Years of Age.—Perret (*Ann. de Méd. et Chir. infant.*, April, 1906), says that diarrhea is the principal cause of death in infants, especially in those artificially fed. In the country the mortality reaches 600 deaths in 1,000, in Paris, 265 in 1,000, during the hot months. The cause is improper feeding, both superalimentation and use of milk of bad quality. Either too much milk is given, or too much for the high temperature which renders less food necessary for the child. When at the breast too much milk may be taken, or it may be given too often or at irregular intervals. In summer, milk changes rapidly and becomes a cause of fermentation in the bowels. Prophylactic treatment consists in the regulation of the diet. Regular intervals for feeding and taking smaller amounts suffice in nursing infants. The amount taken should vary with the weight of the child, the quality of the milk, and the assimilative power of the child. Mixed feeding must be resorted to sooner or later in all cases. The food used should be sterilized milk. In artificial feeding, the amount given

should be 100 grams for each kilogram of weight. In the last two months of the first year the author adds a little flour to the milk to thicken it. In the second year he allows gruels. He does not give eggs. The milk should not be skimmed or diluted. The treatment consists of education of the mother first of all. As soon as diarrhea begins it is well to put the child on sterilized water alone for 24 hours. Then begin gradually to give milk again. In severe cases the starvation must continue longer, and white of egg or gruels may be given. Antisepsis and lavage of the intestine are useful. The principal medicines that are found useful are purgatives, antiseptics, and astringents.

Constipation in Infants.—Thomas S. Southworth (*Ann. of Gyn. and Ped.*, June), says that the constipation of bottle-fed infants is ordinarily best met by a general increase of the strength of the food with possibly a somewhat greater increase in the fat, but not to over four per cent. Orange juice should be given after six months of age, and if there be the usual evidences of rachitis, cod liver oil also. Oatmeal gruel may be used as the diluent and a malt sugar preparation may be substituted wholly or in part for other forms of sugar. These measures, one or several of which may be required, according to the stubbornness of the case, usually suffice; but if they fail cascara is the best regulative, increased from small doses until results are obtained. Infants require relatively full doses of cascara preparations.

Juvenile Spinal Deformities.—Max Böhm (*Bost. Med. and Surg. Jour.*, May 31) has examined, with the x -rays, a number of cases of juvenile spinal deformity. Of these, not a single case showed normal numerical conditions; but each showed numerical variations of the vertebræ. He believes that numerical variations of the spine lead in by no means every case to spinal deformities, but may occasion them. As to the connection between lumbosacral variations and spinal deformities, which he has studied especially, his theory is that the ilium, in its traveling downward during intrauterine life while the number of vertebræ is increasing, may vary in its attachment to the spine not only as to the height of attachment, but also as to the direction; *i. e.*, it may be rotated, etc., may finally vary as to its size, the latter in connection with the whole lower extremity. While in the first case a numerical variation of the spine will be the consequence, in the second and third cases a pelvic deformity will result, such as oblique oval pelvis, etc. (known as congenital to obstetricians). Combinations of the three anomalies are frequent. If these anomalies take place asymmetrically the pedestal of the spine, namely, lower extremities, ilei and *sacral wings* (costal pieces) will *primarily* become asymmetrical during embryonic life (first six weeks). When the child begins to walk and gradually becomes adapted to the erect position, the bodies

of the sacral vertebræ will develop asymmetrically, and this *secondarily*, due to the abnormal static conditions caused by the primarily asymmetrical pedestal. Thus the foundation of the spine will become asymmetrical, and finally, in the course of development, the free, presacral spine must adapt itself to the asymmetrical base. The visible expression of this adaptation is the deformity, which, according to this theory, cannot develop and manifest itself until the time at which the features of the erect position are gained—about puberty.

Abscesses in Connection with Spinal Caries.—These so-called abscesses, says T. H. Kellock (*Clin. Jour.*, May 30), are really collections of broken-down tuberculous granulation tissue, and the word pus is used, in speaking of their contents, only for convenience. They arise through such breaking-down in the affected vertebræ, with infection of surrounding tissues, which form the walls of the so-called abscess cavity. From the walls of the cavity formed in this granulation tissue comes most of the pus. These abscesses are comparatively harmless as regards the general health, so that it is often better to improve the general condition rather than to open the collection and allow mixed infection and possible sepsis. The abscesses travel in the direction of least resistance, along fascial planes and muscle sheaths. Unless mixed infection occurs they rarely burst into neighboring cavities. In the upper cervical region, unless rupture into the mouth is caused by the surgeon's finger or other violence, they burrow toward the surface immediately behind the upper part of the sternomastoid. Chronic retropharyngeal abscess may cause only slight difficulty in breathing or swallowing or slight change in the voice. In the lower cervical or upper dorsal region, pressure of the abscess may cause fatal compression of the trachea or interference with respiration resembling that due to an aneurysm in an adult. This latter dyspnea may be spasmodic and usually most marked at night, sometimes entirely absent during the day. In the middle and lower dorsal, the lumbar and sacral regions, the psoas abscess is the common result; less often the swelling appears in the lumbar, sciatic or ischiorectal region. In treating these abscesses the underlying principle is to regard them as collections of tuberculous material, not as septic abscesses. What can be done is to remove the products of the diseased bone and the lining of the cavity, which produces its contents, and to improve the general health. The abscesses should be opened early, while they are deeply seated, and through the thickest layer of healthy tissue available, not where near the surface, as it is desirable to have a large quantity of unaffected tissue to bring together afterwards to wall them in. For this reason openings should be made through, rather than between, muscles. The contents should be evacuated, the granulation tissue lining the walls gently scraped away, the cavity irrigated

and then thoroughly dried. The irrigating fluid is of little importance, as its action is chiefly mechanical. Iodoform emulsion left in the cavity acts as a foreign body; zinc chloride and carbolic acid act only superficially upon the granulation tissue, and their use is followed by increased discharge. Adrenalin solution is useful, as it renders the cavity dry. Prolonged drainage usually leads to mixed infection in time or to a permanent fistula. Even temporary drainage leaves a weak spot in the wound, which is likely to become infected with tuberculosis and form a sinus. It is better to swab with adrenalin solution before closing and to remove fluid which may collect subsequently with an aspirating needle, more than once if necessary. If fluid is still present after a week or more, it is usually like the original contents, and the operation should be repeated. It is a mistake to open an iliopsoas abscess in the loin, even if presenting there. The best place for the wound is in the highest part of the cavity, when the patient is lying, so that it may unite firmly before fluid recollets. In cases connected with lower cervical or upper dorsal disease, the patient may be kept erect in a rigid jacket, so that if caseation and drying up do not occur, the abscess may find its way eventually into the psoas muscle or other accessible place. If it causes severe symptoms it is best to make a longitudinal incision in the back at a little distance from the mid-line, remove the head and neck of one or more ribs, and approach the abscess from the side of the vertebræ.

Surgical Treatment of Empyema.—In most cases of infantile empyema, says P. Lockhart Mummery (*Brit. Jour. Child. Dis.*, May), the infection is purely pneumococcal and little is required from a surgical standpoint, except letting the pus escape and so allowing the lung to expand. Drainage for any length of time is unnecessary and may even interfere with reexpansion of the lung. In such cases the drainage tube may usually be removed on the second or third day. In cases with small effusion of the pneumococcal type, where the elasticity of the lung has not been seriously impaired, so that it expands well after removal of part of a rib and allows the pus to escape, no tube need be inserted. It is only necessary to turn the patient on to the affected side, when crying or coughing will expand the lung and expel the effusion. In some cases pus will again accumulate and it will be necessary to reopen the wound. Since the effusion is so often of pneumococcic origin, operations for empyema must be conducted with strict asepsis, so as to avoid mixed infection of the damaged pleura then or in subsequent dressings. In pneumococcic cases, when prolonged drainage is not a serious consideration, the midaxillary line is the most convenient site for opening the chest. In mixed and septic cases an incision just below the angle of the scapula is to be preferred, on account of the better drainage. As regards the

anesthetic, chloroform-ether or very light chloroform is best, combined with oxygen inhalation. With a large empyema the pus must be allowed to escape slowly; in some cases previous aspiration is safer. In foul empyema, or if there is much pyogenic membrane, irrigation of the pleural cavity after making a free incision is advised; normal saline solution or sterilized water should be employed. This removes large pieces of pyogenic membrane which would act as foreign bodies and keep up the discharge. Operation is indicated as soon as the presence of pus within the pleural cavity has been discovered; any delay seriously affects the result. Pressure by dressings or bedding should be avoided, as it interferes with respiration. After operation, while an opening exists in the chest, expansion of the affected lung is best secured by having the child blow forcibly through a small tube or a trumpet which will not make a noise unless blown hard. After the pleural cavity has closed by healing of the wound or formation of adhesions between the parietal and visceral pleura, expansion is to be favored by deep inspirations and gymnastic exercises to develop the arm and chest muscles. The writer favors the establishment in all children's hospitals of surgical gymnasia, such as are found in most Swedish and some German hospitals. Careful after-treatment will often do away with such secondary operations as Estlander's, which produce deformity of the chest and often spinal curvature. In all cases such an operation should not be done hastily, but time should be allowed to reexpand the lung by exercises if possible.

George Carpenter (*ibid.*) recommends the eighth intercostal space just outside of the angle of the scapula as the site for incision, as it affords good drainage, whether lying or standing. Washing out the pleural cavity, he says, serves no good purpose and is dangerous. The two most important points in the after-treatment of empyema are fresh air and exercise, short of fatigue. The child with empyema should not be kept in bed longer than is absolutely necessary, and as soon as his strength permits he should be up and walking and finally running about in the open air.

Uncinariasis.—Samuel S. Adams (*Arch. of Ped.*, April) reports a case of this affection occurring in a boy 12 years of age. The patient was a native of St. Mary's County, Maryland, but residing in Washington, D. C., when the symptoms developed. The diagnosis was confirmed by the finding of the ova of *Uncinaria Americana* in the feces by the Public Health and Marine Hospital Service. Recovery followed the thymol treatment.

Typhoid Fever in Children.—Alfred Hand and J. C. Gitting (*Arch. of Ped.*, June) present an analysis of 145 hospital cases of typhoid in children, ten of whom were under three years of age. Fifty-seven per cent. were boys, forty-three per cent. girls. The Widal reaction was positive in 95 per cent. of the cases. The

tongue was coated in 80 per cent. Spots were found in 70 per cent. of the white children. Splenic enlargement was detected in 69 per cent. of the patients. Abdominal pain or tenderness was noted in 37 per cent.; abdominal distention in 20 per cent. Twenty-two per cent. were constipated throughout the attack and 53 per cent. became so after a diarrhea of more or less severity. Delirium was present in 18 per cent.; 13 were drowsy, 11 irritable, 2 restless; 2 had convulsions; 6 had various nervous symptoms. Twenty-six per cent. had bronchitis; about 5 per cent. each had bronchopneumonia and croupous pneumonia. Blood counts were made 121 times, 103 being in uncomplicated cases. In but 9 cases were there less than 5,000 leukocytes. Seventy-one gave counts of from 5,000 to 10,000, while 31 uncomplicated cases had from 10,000 to 16,000. Of 18 complicated cases one-half had a leukocytosis of 11,000 to 43,000, the other half ranged from 5,000 to 10,000. Relapses occurred in 4.8 per cent. The mortality was 8 per cent.

Fecal Impaction in Typhoid Fever.—D. J. M. Miller (*Arch. of Ped.*, June) reports two cases of this complication which suggested serious intraabdominal trouble. The first occurred in a girl of 12, after a diet of milk and lime-water, with constant constipation which required daily enemas. Symptoms developed suddenly on the 29th day, after she had been sitting up in bed for four days. Perforation was first suspected, then appendicitis. Almost continuous liquid diarrhea led to rectal examination and the discovery of hard fecal masses. The second patient was a boy of 10, on the same diet. Severe symptoms of obstruction developed on the 40th day. A similar diarrhea led to the diagnosis and proper treatment. The writer says that when constipation persists through the active and convalescent stages of typhoid fever, enemas are not sufficient as they simply unload the lower bowel. In addition, occasional laxatives should be administered by mouth. An exclusive milk diet is not advisable when constipation persists; besides giving beef-juice and broths, the milk should be mixed with cereals or preparations of malt. A frequent liquid diarrhea in a person habitually constipated, or following typhoid fever, should always excite suspicion of fecal impaction.

Diphtheria Antitoxin in Chorea.—B. F. Hamilton (*Med. Rec.*, June 16) noticed that, after the administration of antitoxin to a boy suffering from diphtheria who had had a severe attack of chorea for several months, the choreic movements ceased and did not return. He has recently tried this procedure in a case of chorea which had failed to improve under large doses of arsenic, chloral hydrate, and potassium bromide. This patient was 20 years old. He was given 3,000 units of diphtheria antitoxin. In four hours the temperature had risen to 102 degrees; five hours later this had subsided and with it the choreic symptoms, though delirium continued. Twenty-four hours after the

first injection there were still some choreic movements, so 2,000 units were administered. In four hours the temperature had reached 100 degrees. By evening all irregular muscular movements had ceased, and, a month later, had not returned.

Contagion of Diphtheria through a Third Person.—Paul Sittler (*Munch. med. Woch.*, May 1, 1906), cites examples from literature, as well as from his own experience, which show that the bacillus of Löffler is often found in the throats of persons attending those sick with diphtheria, as well as of the children of the family who have been immunized. Immunization does not prevent them from carrying the germs about in their throats and transmitting them to the well. In schools in which cases of diphtheria have appeared Löffler bacilli are often found in the throats of the well children, as well as in throats affected with an ordinary form of tonsillitis. They are also found in the nasal discharge of children affected with a simple catarrh. There seems to be no doubt that patients who are allowed to leave the hospital too soon after having diphtheria may communicate a virulent form of the disease to others. One of the author's cases occurred in a healthy mother to whom a child which remained well carried diphtheria from a sick sister. In the second a healthy mother, whose breast became infected from another child, infected her new-born infant who was nursing at the affected breast. The author concludes that it is not sufficient to isolate the patient who has diphtheria and to disinfect the sick room; there is a possibility of the carriage of the typical diphtheria by an uninfected person by means of germs in the throat.

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ORIGINAL COMMUNICATIONS.

THE CONSTRUCTION OF A NEW VAGINA.

BY

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(With 15 illustrations.)

DEFECTS in the patency of the vaginal canal are of unusual occurrence and always interesting. That the condition is not excessively rare may be inferred from the circumstance that ten years ago Neugebauer¹ was able to collect 1,000 cases, including 72 original observations. The present study embraces principally the literature of the subject since that time, and has for its object the crystallization of the various methods of operative treatment into more or less set forms. For it is a regrettable fact that our text-books give very little definite aid, usually dismissing the subject of treatment in very few words; and the operator who meets his first case must either rake up the voluminous literature of the subject or, perhaps (which is more often the case), do incomplete and unsatisfactory work while groping about trying to rediscover methods already tried and solving problems already solved.

The imperforate or absent vagina is either acquired or con-

genital. Formerly, all cases in which a distinct traumatism could be excluded were regarded as congenital in origin. We know, since Nagel², and later Veit³, called our attention to the circumstance, that cases formerly considered as congenital are frequently acquired during intrauterine life and are the result of broad adhesion of the mucous membrane surfaces of the vagina. These cases are intrauterine, but acquired. In extrauterine life catarrhs of the genital tract in early infancy or childhood and due to the exanthemata and other diseases (scarlet fever, diphtheria, typhus fever, cholera, smallpox or pneumonia) may result in various grades of atresia or obliteration of the genital tube. Injuries, ulcerations and burns during this period of life may be followed by the same result. Caustic applications with the object of closing the parts after illegitimate intercourse during childhood sometimes result in atresia. In adult life stenosis or imperforations of the vaginal canal have frequently followed sloughing processes in the vaginal mucosa after difficult instrumental labors. In some cases a distinct phlegmonous dissecting perivaginitis has been known to result in the complete disappearance of the vaginal canal after childbirth.

In cases of acquired obliteration of the vaginal lumen the absence of the vagina may be partial or complete. In fact, even the cervix may become indistinguishable in the cicatricial tissues. As the uterus and adnexa are usually present and normally developed in these cases, it will be readily understood why many cases of acquired imperforation of the vagina may be associated with hematocolpos, hematometra and hematosalpinx.

Vaginal obliteration may be congenital and is then regularly associated with anomalous errors in development of affiliated structures. Thus, with complete absence of the vagina, will usually be found the absent, rudimentary, or imperfectly developed uterus. The adnexa may similarly be absent, unilateral, or bilateral, according to the error in embryonic development.⁴

With the exception of certain details in regard to the exact origin of some of the structures which enter into the formation of the organs of generation, the accompanying figure (Fig. I), by Nagel⁵, shows, schematically, at a glance, the internal genitalia of the female human embryo. The Wolffian body (con-

sisting of tubules which have developed in the mesoderm from so-called "nephrotoms") is the principal structure present, being replaced later by the kidney, and from it, by distal continuation, the urogenital fold arises. The ducts of Müller develop and lie at the upper part external to the Wolffian duct, and at the lower part, after the urogenital fold has made a spiral twist, they lie internal to the Wolffian ducts. These ducts of Müller, which enter the urogenital sinus, ultimately coalesce and constitute the future vagina, uterus and Fallopian tubes. It is claimed by some that the ducts of Müller are,

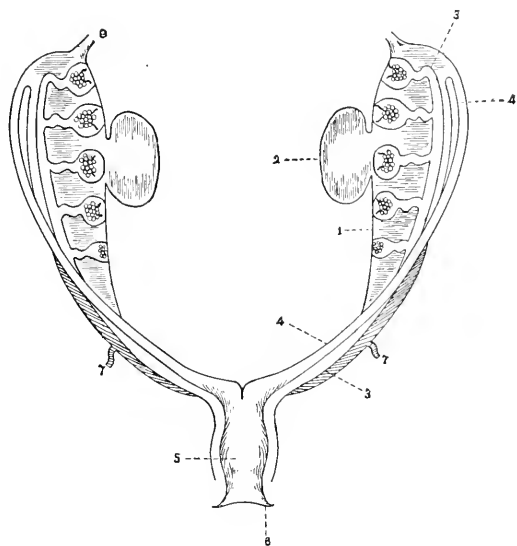


Fig. I. Schematic figure of the internal genitalia of a female human embryo of $\frac{3}{4}$ centimeter (*Nagel-Bandler*).

1, Wolffian body; 2, sexual gland (ovary); 3, Wolffian duct; 4, duct of Müller; 5, genital strand; 6, opening of lower end (future vagina) of genital strand into the urogenital sinus; 7, gubernaculum Hunterii; 8, diaphragmatic band of the mesonephros.

in part or whole, given off by the Wolffian duct, but this is not probable (*Bandler*).⁶ The views of embryologists differ as to the origin of the Wolffian duct which develops near the ectoderm. According to *Bandler*⁷ the most recent views regard it as arising entirely from the ectoderm. The two Wolf-

fian ducts and the two ducts of Müller enter the urogenital sinus, forming the "prominence of Müller." The intervening tissue forms the hymen. The union of the ducts of Müller is complete at the third month up to the ligamentum teres. The walls of the tubes and uterus originate from the mesodermal elements of the Wolffian body and urogenital fold. From the lower ends of the ducts of Müller the vagina develops and, at the same time, the urogenital sinus becomes shorter, the latter ultimately constituting the vestibule. "The position of the vestibule of the vagina immediately surrounding the urethral opening, and the external opening of the vagina, the upper surface of the hymen, and the region of the openings of the glands of Bartholin, belong to the *entodermal urogenital sinus*. The ectodermal urogenital sinus forms that part of the vestibule covered by the labia minora" (Bandler). The ovary arises from ectoderm or mesoderm (Wolffian body) according to different writers.

From an excellent paper written by Mary Putnam Jacobi⁸ some ten years ago, the following table—attributed to Tourdes—is abstracted. Although not in absolute accordance with the

	<i>Embryo</i>	<i>Adult Female</i>
Deep Segment.....	Genital Ridge and Gland (Undifferentiated)	Ovary.
	Wolffian Body.....	Kidney.
Middle Segment..	Wolffian Duct...	Duct of Gärtner.
	Müller's Ducts...	Canal of Rosenmüller.
		Pediculated Hydatid.
		Fallopian Tubes, Uterus and Vagina.
	Urogenital Sinus.	Vesical Trigone.
		Urethra.
		Vestibule.
External Segment.	Genital Tubercle...	Clitoris.
	Genital Furrow....	Vulva.
	Genital Fold.....	Labia.

views of some of the most recent students of embryology, it gives a bird's-eye view of the three segments of the embryo which later develop into the urogenital tract of the adult female.

By the aid of this table, with a little thought, we are able to define the embryological errors resulting in defects of development. Thus many cases are on record in which the urethra was so large—in the absence of a vagina—that the finger or even the male organ could readily be passed into the bladder. Some writers seem to regard this condition as the result of traumatism, induced by masturbation or copulation. As a matter of fact it merely represents the persistence of the embryonic urogenital sinus which, as is seen in the table, is derived from the external segment in conjunction with the clitoris, labia and vulva.

On the other hand, complete absence of Fallopian tubes, uterus and vagina, indicates a defect in the coalescence of Müller's ducts which normally should occur. These ducts

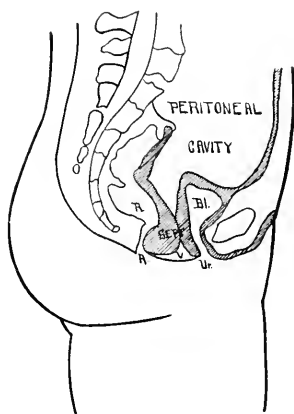


Fig. II. Schematic illustration of a case of complete absence of vagina and internal genitalia. R, rectum; A, anus; V, vulva; Sept., [septum between bladder and rectum; Bl., bladder; Ur., urethra.

are derived from the deep segment, which accounts for their presence in certain cases in spite of the absence of vagina and uterus or their rudimentary development. In fact, operators have felt justified in laparotomizing patients with absent or rudimentary vagina and uterus but functioning ovaries, with no other object than to remove the ovaries.

The oldest allusion to the absent vagina⁹ (Fig. II) is attributed to a layman and dates back to the year 1639. Although we

have an English translation by Simes, the original language of the Comte de Bussy is quoted as he describes to his cousin, Mademoiselle de Romovantin, the conditions which he found present in his mistress. "Vous rencontrez d'abord un beau portail avec desmoresques, soutenu de deux colonnes de marbre blanc; et comme vous pensez entrer, vous trouvez que c'est une perspective qui vous a trompé les yeux et que la nature en a muré la porte, dans laquelle elle a seulement fait une forte petite fente pour les menues nécessités et les égouts de la maison." The lady, in spite of her infirmity, was imbued with great passion for her lover.

The earliest operations were done through the perineum, with a trocar, with the object of allowing pent-up blood to escape. Thus, Howslip¹⁰, in 1810, made such a puncture and kept the opening patent within a wax candle. Tretau,¹¹ in 1812, following the prevalent custom of the day, made a similar puncture for hematometra, but was unfortunate in opening into the bladder. Later operators, like Dupuytren,¹² in 1817, made the openings with the fingers and knife (a method which even the late Professor T. G. Thomas preferred to that of Amussat); but as all of his patients died, Piqué "preferred to let the patients die from a slow and distant death rather than from the sure and quick death brought on by the metritis which follows the operation." This same view was held by others at the time and later. This fear of death induced writers (like Braxton Hicks), even in comparatively recent years, to suggest opening into these blood collections through the rectum.

The operations which have been done for imperforate or absent vagina may be classified thus:

- I. *Per Vaginam and Extraperitoneal.*
 - a. *Methods of Blunt Dissection leaving Raw Surface.*
 - b. *Methods by which Raw Surface is covered with Pediculated Flaps.*
 - c. *Methods by which Raw Surface is covered with Transplanted Skin or Mucous Membrane.*
- II. *Per Vaginam, Combined with Vaginal Celiotomy.*
- III. *Per Vaginam, Combined with, Preceded by, or Followed by, Abdominal Section.*
- IV. *Per Vaginam, Utilizing the Rectum or Sigmoid Flexure.*
- V. *Abdominal Section.*

I. *Per Vaginam and Extraperitoneal.* a. *Method of Blunt Dissection leaving Raw Surface.*

In spite of the tendency of most writers on the subject to give priority to Amussat for instituting blunt dissection, the credit of the modern operation for the construction of a new vagina really belongs to Dupuytren (1817), who combined the "use of a cutting instrument and tearing of the cellular tissue" (Thomas) and accomplished the operation in a single sitting; this being practically the foundation of most of the operative procedures resorted to at the present day.

The following description of Dupuytren's operation, with modifications added by Puesch, is taken from Thomas' *Treatise on the Diseases of Women*:

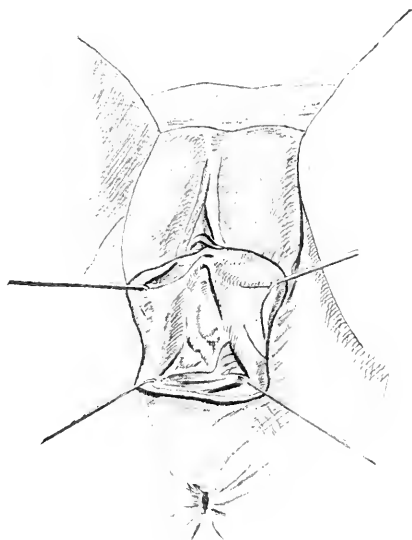


Fig. III. Absent vagina showing interlabial partition (*Montgomery*).

"After having arranged the woman in a convenient position' the bladder is emptied by means of a male catheter, which is given to an assistant who holds it turned upwards. It is not removed during the operation, except when the obliquity of the part would render it troublesome. The index finger of the left hand is then carried into the intestine as far as possible, in order to serve as a guide for the bistoury and at the same time as a protection to the rectum. After these pre-

liminary steps the operator, placed between the thighs of the patient, makes a transverse incision at the center of the obstacle, or in the vulvar orifice if the vagina is completely wanting; if the cellular tissue is lax, he can tear with his finger, the sound, or the handle of the bistoury, the vesical and rectal walls, till he reaches the tumor; if it is tense or too resistant, the surgeon dissects by gentle efforts, separating the tissues with the handle or the finger, rather than cutting them, and, if it be necessary, breaking them down at the edges with a button bistoury. In each case he proceeds slowly and carefully, stopping from time to time to examine with the finger and be certain at what distance those organs are situated which it is necessary to avoid. When the canal, which has been reopened, will admit the index finger easily, and when a more distinct perception of fluctuation announces the proximity of the sanguineous collection, the operator is warranted in plunging a trocar into this, and the pouring out of a syrupy brown liquid, like the lees of wine, will show that the end has been reached."

Although Villaume,¹³ in 1823, constructed an artificial canal through a perineal incision, which was still present two and a half years later, most authors attribute to Amussat (1832) the honor of being the first to attempt to create a new vagina. The operation of Amussat was based on the principle of blunt dissection, and the following description is taken from Neugebauer.¹⁴

The patient was a girl of sixteen, with complete absence of the vagina, complicated by left hematosalpinx. By pressure of the finger in the navicular fossa the tissues seemed to yield without tearing. In the excavation thus made, Amussat placed a small sponge. Several days later he bored to a greater depth and repeated the same procedure at intervals of several days, keeping the cavity open with sponges. After a certain depth had been reached, he pushed a trocar into the liquid tumor above and allowed some black blood to escape, after which, with carefully protected bistoury, he freely opened the sac, from which ten or twelve ounces of chocolate colored blood emerged. A rubber drainage tube was then introduced, allowing the rest of the blood accumulation to gradually find its way out. In the course of the convalescence there was an escape of blood per rectum (ulceration through rectal wall), with vomiting and fever. At times the patient was so low

that her life was despaired of. Gradually, however, she emerged from her desperate condition and finally recovered. The operation, to sum up, required ten days and six sessions.

About this time (1831) Fletcher¹⁵ incised the skin to a depth of two inches. With a hammer he gradually drove in a bougie, during several sessions, until he reached the blood accumulation in the uterine cavity. The menses appeared after this and the patient later gave birth to two children.

Debrou,¹⁶ in 1851, operated upon a case of "complete and congenital obliteration of the vagina, with occlusion of the os uteri," by opening up the vagina and cervix, and kept the ar-

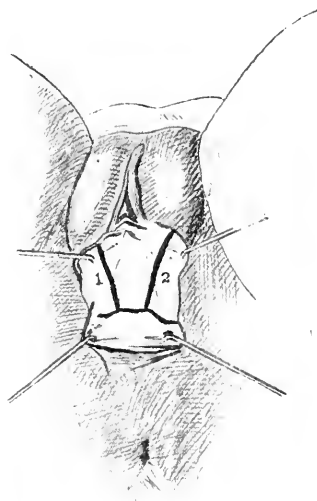


Fig. IV. Line of incision for formation of flaps. 1, 2, flaps from labia minora which are split and used to line the vagina (*Montgomery*).

tificial vagina open with lint. The patient subsequently married, became pregnant and was seized with eclampsia. The forceps was applied to deliver the child, which was born dead, and the mother succumbed shortly afterwards. This same Debrou frowned on all attempts to construct an artificial vagina for the sole purpose of coitus, "because of its great and frequently fatal danger."

In 1866, Dolbeau¹⁷ made a transverse perineal incision and, by blunt dissection, opened up a hematocolpos and hematometra. He employed thick copper cylinders to stretch the parts.

Five years later the patient married and was delivered spontaneously at term of a child.

Leon Le Fort,¹⁸ in 1876, resorted to electrolysis for the purpose of drilling a vaginal canal. His case had been previously operated on no less than ten times with only a funnel-shaped passage $1\frac{1}{2}$ cm. deep resulting. The eleventh intervention was followed by an attack of pelveo-peritonitis. Le Fort then resorted to electrolysis, scorching small areas of tissue daily, until a free passage to the cervix was secured. This passage was widened by daily treatment of the same kind continued during the following month. In spite of fistulæ into the bladder and rectum following this method in the hands of others, Sitsinsky writes enthusiastically of the possibilities of this plan of procedure in appropriate cases.

During the past quarter of a century repeated attempts to bore a passage way through the rectovaginal septum, to be kept open by subsequent dilatation with glass plugs, were made by numerous operators and with frequent failures. One of the principal operators in gynecology in this country assured the writer that he thus attempted to create a new channel in three different cases, with complete failure in each. It will be readily understood, therefore, why many cases have never been reported. Thomas and Emmet, a score of years ago, referred to such attempts. Segond¹⁹ and Tuffier,²⁰ in 1895, each reported a case with indifferent results. Villar,²¹ in 1895, made a transverse incision and kept the resulting canal, after separating bladder from rectum, open, with a rubber cylinder, worn for six months.

Leopold,²² in 1896, split the recto-vaginal septum in a case of vaginal atresia and, by blunt dissection, dug out a canal down to the cervix, which was kept open for months with glass plugs. The result was good and the patient subsequently married.

Berrut,²³ in 1897, reports the case of a girl of 31 who never menstruated, but who had vicarious nose bleeds. She had neither vagina nor uterus. He bored a canal between the bladder and rectum to a depth of 3 or 4 cm., which he packed with cotton. On the following day he dug in 3 or 4 cm. further and came across a membranous diaphragm. He packed again with cotton. On the following day he broke this membrane through with his finger and found that his channel led to a

simple cul-de-sac. He kept the newly-made channel open with cotton plugs. Three months later a stricture formed at the site of the membranous diaphragm, which was about 2 cm. anterior to the end of the blind pouch referred to. This stricture he treated by dilatation. The result was a canal reaching to the depth of a finger, which admitted a Cusco speculum. The patient married and enjoyed her sexual life. After a year the husband died. Five years later the canal was still present, but somewhat contracted.

Barnett,²⁴ in 1902, reports a case of vaginal atresia with unilateral tube and ovary, but no uterus. This patient suffered

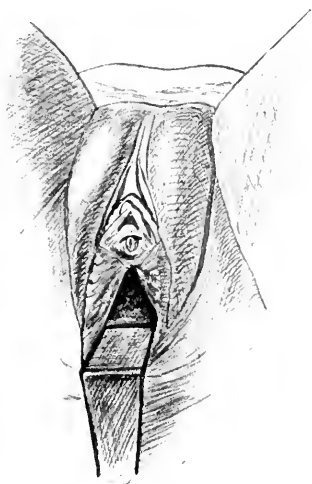


Fig. V. Flaps sutured in place and showing new vagina (*Montgomery*).

from vicarious nose-bleeding. The vagina could be depressed to a depth of one and one-half inches. This writer claims that up to this time there had been reported not more than thirty cases of complete absence of the vagina (!). He made an opening through the vaginal septum into a "musculo-membrano-cartilaginous" pouch, out of which a dark menstrual fluid escaped. The Fallopian tube could readily be sounded. He adds that "the Fallopian tube supplied the uterine deficiency and did the menstruating."

According to Cox,²⁵ in 1902 Henrotin, in a case of vaginal

atresia due to "adhesion or organized union between the opposing vaginal walls," resorted to simple incision and packing—the woman being later delivered of a child.

Collinet,²⁶ in 1902, describes a fatal intervention of this kind. The patient was 15 or 16 years old and married. The vagina was represented by a cul-de-sac 3 or 4 cm. in depth. The uterus seemed to be the size of one at the seventh month of pregnancy and was distended with menstrual blood. By rectal examination the obliterated vagina seemed to extend up a distance of 2 or 3 cm. After blunt dissection for 2 cm. through this soft but dense area, a cavity was opened from which a little blood escaped. The opening was enlarged, when a liter of blood came away. On the sixth day the patient developed fever and several days later she died.

Ozenne,²⁷ in 1902, met a case which had been mistaken for a thick hymen. Uterus, ovaries and vagina were all absent. After cutting to a depth of $2\frac{1}{2}$ cm., the attending physician recognized that he had made a mistake in diagnosis. Three weeks later the same medical man undertook to construct a new vagina, but, after boring a hole in the rectum, he desisted. Four days later Ozenne passed a tobacco-pouch suture around the edges of the tear and nearly brought them into apposition. The fistula ultimately healed. The woman had been married four years with a shallow vaginal pouch.

A. Laphorn Smith,²⁸ in 1905, constructed a vaginal canal by the method of blunt dissection. A laparotomy later for appendicitis in the same patient gave him an opportunity for examining the anomalous conditions present in the pelvis. There was no uterus or vagina and the right adnexa were missing. The left ovary was normal in size and appearance, and the left tube was normal at its fimbriated end, but terminated at its proximal end in a little club-shaped knob. The right broad ligament came right from the pelvis onto the bladder and abdominal wall. On the left side it formed an ordinary broad ligament, in which ran the tube, not transversely, but diagonally downwards, that is to say the fimbriated end of the tube was at its normal level, but the uterine end ran down to where the vagina ought to have been, and ended there. There was no real broad ligament on the right side. The new vagina, in the course of time, grew smaller and shallower.

b. *Methods by which Raw Surface is covered with Pediculated Flaps.*

Heppner,²⁹ in 1872, conceived the idea of covering the raw surface left after blunt dissection, with pediculated flaps from adjacent skin and mucous membrane. Several years later Credé³⁰ independently employed the same method. The idea of Heppner was to make an H-shaped incision in the interlabial diaphragm, utilizing the flaps above and below the horizontal bar of the H as flaps to cover the anterior and posterior surfaces respectively of the new vagina after its creation by blunt dissection. Two elliptical incisions in the region of the buttocks yielded flaps to cover the two lateral raw surfaces. In dissecting out the flaps care was taken to leave an attached pedicle by which its circulation was kept up undisturbed. Each flap was then turned into the vagina and secured by silver wire. Heppner's effort was followed by success. In Credé's case, after creating a new canal, the labia minora were detached in great part and sewed to the cervix. One of the skin flaps from the labia majora (like a case of Leopold's) later grew hair within the vaginal lumen. The flaps became attached to the raw surface and a year later the operation was considered very successful.

Martin,³⁷ in 1885, excised the atresic area in the vaginal canal and covered over the raw surface by sewing the upper to the lower segment of mucosa.

Delagenière,³¹ in 1886 (?) found, at the vaginal orifice, only a blind sac 2 cm. deep and consisting of a quasi-mucous membrane, which could be depressed to a distance of 4 or 5 cm. He made a transverse incision posteriorly and dissected away the posterior margin of the blind sac from the rectum. Two side cuts were added to the first so as to render the loosened flap perfectly mobile. A passage was then created to a depth of 7 cm. Through the free end of the flap he passed three sutures and secured it by this means to the anterior wall of the new vagina. For the posterior wall he took two skin flaps from the buttocks, each measuring 3 x 8 cm., and secured them also in place by means of sutures. The operation was successful, but later the new canal had become shortened by one centimeter.

Azema,³² in 1893, reported a case of hematometra with complete absence of the vagina. His operation may be divided

into three stages. First stage: A vertical incision was made in the interlabial space and with blunt dissection a channel created in which the cervix was sought for, but could not be found. The uterus was punctured with a trocar, allowing the pent-up blood to escape, and the wound was packed. Second stage: A month later another puncture into the uterus was necessary to allow the menstrual blood to escape. After enlarging the opening, a catheter at first (and later a drainage tube) was left in the uterine interior. Third stage: As the vaginal channel was rapidly closing up, pediculated skin flaps from the adjacent integument were fixed with sutures into the new vagina. Six weeks later the flaps were adherent, but the canal was much contracted. A year later there was still further contraction but the canal was still pervious.

Lipinski,³³ in 1895, had a case of post-partum vaginal atresia extending upwards a distance of more than 3 cm. and of such marked degree that only a sound could pass through its caliber. On resorting to gradual dilatation, a recto-vaginal fistula was produced. Lateral incisions through the strictured area were of no benefit. After removing the granulating surfaces, he sutured on both sides flaps consisting of the labia minora dissected away from the clitoris to their lower extremities. The result was good.

Schwartz,³⁴ in 1895, after creating a vaginal canal, covered the raw surface with four flaps taken from in front, behind, and the lateral tissues. He had a successful result. Tuffier,³⁵ at the meeting at which this was reported, announced an unsuccessful operation of this kind.

Lenger,³⁶ in 1895, had a case of absent vagina with hematometra, in which frequent epistaxis occurred. With a finger in the rectum and a bougie in the bladder he made a transverse incision midway between the bladder and the rectum. After opening up to a depth of 9 cm. he came across a membrane closing the orifice of the cervix. In this a crucial incision was made, allowing pent-up blood to escape. With the appearance of granulations in the wound he liberated a portion of the vestibular mucosa and of the intervulvo-anal skin. These flaps were pushed into the depths of the raw canal. Later, dilatation was kept up artificially. The result in this case was good.

In a case of incomplete absence of the vagina, Mangoldt

(1896) found a narrow fistulous tract about 6 or 8 cm. deep. The girl was 22 years old and had never menstruated. Besides the rudimentary vagina the local examination discovered the tubes, ovaries and hymen present. As the girl wished to get married, Mangoldt undertook the construction of a new vagina. He started to enlarge the fistulous tract by means of blunt dissection, intending to cover the raw surface with a flap which included most of the hymen and perhaps another one from the adjacent surfaces. But the vagina tore, so that he was obliged to split its lumen. He now decided to rely on the flaps above mentioned combined with the strip of epithelium present in the rudimentary vagina. At the end of three months the new canal was entirely covered with skin and, after ten months, the girl got married with a vagina 7 cm. deep and easily admitting two fingers.

Bode,³⁸ in 1896, reported bad results in three cases of complete vaginal atresia (the last case being somewhat doubtful) in which, after the recto-urethral septum had been deeply split, vulvar flaps had been stitched into the new canal.

Schwartz,³⁹ in 1897, treated a girl of 20 who had never menstruated, although she suffered from monthly attacks of abdominal cramps. There was no sign of a hymen and a minute aperture admitted a probe for 2 mm. The sound in the bladder touched the finger in the rectum at a depth of 5 cm. There was congenital absence of the lower two-thirds of the vagina, a small unicornuate uterus and, between the two, a vaginal cyst about the size of an egg. After making a transverse vaginal section, he opened into the cyst by blunt dissection. Beyond this, the upper vaginal segment and a small cervix were discovered. The margin of this segment was drawn down and sewed to the vulvar orifice, leaving a canal 5 to 6 cm. deep and admitting one finger.

Carson,⁴⁰ in 1900, did the following operation for complete absence of the uterus and vagina in a girl of 16. He first made a vertical incision through the hymen from the meatus to the fourchette. Then, tearing through the cellular tissue between bladder and rectum, he found a new canal six inches long (!). The labia minora with adjacent skin (one inch above and a half inch on each side) were raised and the labia unfolded. He thus secured flaps 4 inches long and 2 inches wide, which he sewed into the new cavity. Later, a glass plug was worn.

Beck,⁴¹ in 1900, did a flap operation in a very original manner. 1. He made a transverse incision immediately above the symphysis pubis which he carried carefully downward between the peritoneum and the bladder, until he reached the space between the bladder and the rectum. 2. He then made a counteropening from the perineum to meet the other passage; he thus secured a canal extending between the perineum and a point above the pubes without opening into the peritoneal cavity. 3. He next dissected two skin flaps from the thighs of sufficient size to extend through the entire length of the new canal, their bases being represented by the labia. These flaps were seized with forceps introduced from above, drawn through the canal, and fastened by sutures at the upper end. The supra-pubic wound was sewed up. Gauze was passed from below, so as to press the flaps laterally against the sides of the new canal. The result was unusually good, but after a few months of marital experience, the husband deserted his wife.

Cotterill,⁴² in 1900, met a case of complete atresia of the vagina, associated with a small atrophic uterus and normal (?) ovaries. The steps of his technique were as follows: (1) He made an H-shaped incision, the uprights being 3 inches long and extending from the lower extremities of the labia minora to a point a little beyond the anus on either side. The horizontal limb ran $1\frac{1}{2}$ inches midway between the meatus and anus. These flaps were reflected to their respective bases. (2) A large vaginal opening was bored through with the fingers. The uterus was felt and pushed upwards, but the peritoneal cavity was not opened. (3) A second pair of flaps about seven inches long and three inches wide were raised by making an incision on each side, which began just below the tendon of origin of the adductor longus and passed obliquely downwards and outwards parallel to the buttock fold and which then was brought back to meet the top of the upright of the H-incision on each side. (4) These two flaps were slid to meet each other in the middle line with their raw surfaces facing each other. The four flaps were united along their free edges with a continuous suture of fine catgut until a body resembling the finger of a glove, and the outer covering of which consisted of skin, projected from the middle line opposite the new vaginal opening. (5) This was now invaginated into the opening and

kept *in situ* with a large plug of iodoform gauze. (6) The edges of the large buttock wounds fell together and were easily stitched. The plug was not disturbed for ten days, during which period of time the bowels were kept confined. To prevent contraction of the new vagina he had made a rubber bag $2\frac{1}{2}$ by 6 inches, with stem and stopcock, which could be distended with a Higginson's syringe and was to be worn for half an hour twice a day. The operation was perfectly successful and the resulting vagina measured $5\frac{1}{2}$ inches in depth.

Lofton,⁴³ in 1902, reported a case of complete occlusion of the vaginal canal and outlet in a child three years old. At the upper commissure a pin-hole opening was discovered from which a viscid substance dribbled. The labia minora were effaced. As the child suffered from convulsions, which were attributed to this condition, it was decided to operate. With bistoury and scissors the tissues were slit down to the posterior fourchette. With the finger adhesions were broken away up to the wall of the canal. Cutting away the tissue of the labia minora and trimming it until smooth; the labia majora were inverted as far down in the cavity as they would reach and then stitched to the lateral walls of the canal, the attachment being practically at the bottom of the vaginal outlet. The clitoris was separated from adhesions and a wool packing inserted. At the end of three months the child had no more convulsions. The diagnosis of "complete occlusion of the vaginal canal" in this case is open to serious doubt.

Guillet,⁴⁴ in 1902, reports a case of hematometra with complete absence of the vagina in a girl of 15. After making the usual transverse incision through the skin-covered hymeneal region, he separated the bladder from the rectum to a depth of 6 or 7 cm. The uterus was now punctured, when 500 or 600 grams of blood escaped. He now secured two pediculated strips of skin, about 6 or 7 cm. long, from each side of the vulva, and placed them in the vaginal canal. The uterus was next drawn down and the free tip of each flap was sewed into the uterine wound. The operation was completed by packing the canal with gauze, which was changed after two or three days. The result was satisfactory.

Brickner,⁴⁵ in 1903, calls attention to the fact that certain types of vertebrates present normally a transverse septum in the vagina. In the human female it leads, when present,

to different grades and varieties of occlusions or atresias. When present, as a stenotic ring, he advises exsection of the strictured area with suturing of the upper and lower rings to cover over the raw area and prevent subsequent cicatricial obliteration of the vaginal lumen. He met four cases in which the condition was present from birth. The method of operation advised is similar to that recommended by Martin, Vineberg and others.

Anderson,⁴⁶ in 1903, met a case of complete absence of the vagina with the right Fallopian tube and rudimentary ovary present. He discovered also a partially developed one-horned uterus in the right side, the size of a small thumb. The patient

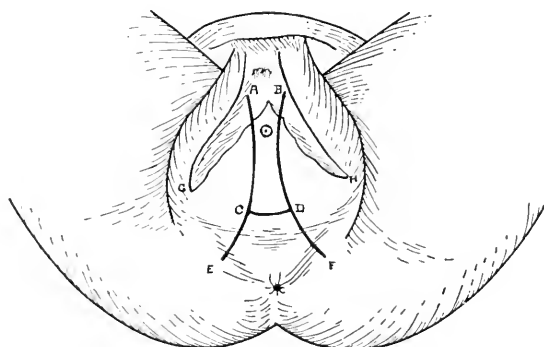


Fig. VI. Anderson's operation with flaps (*Anderson*).

A B C D is the flap obtained from the upper half of the interlabial diaphragm and is placed on the anterior surface of the new vagina; the flap E C D F is utilized for the posterior surface. Laterally the reduplications of the labia minora are split and stretched (A C G and B D H) so as to cover the sides of the new canal.

was a childish-looking girl of 22, who had never menstruated. The vesical and rectal walls were in close contact and most intimately attached to each other, there being hardly more than one-eighth of an inch of tissue between them. He operated as follows: (Fig. VI.) An incision was made through the labium minus of each side near the clitoris and extending down to a point below the insertion of the nymphæ. The reduplication of mucous membrane of each lesser lip was dissected up so as to form a long flap to be secured into the sides of the new vagina. A cross section was made along the free margin of the fold of hymen, using the anterior half with the mucous membrane below the meatus urinarius for the anterior wall of the vagina,

and the other half of the hymeneal fold with the tissues extending toward the rectum for the posterior flap. Midway between the urethra and rectum (with the aid of the sound in the bladder and finger in the rectum) a canal was made measuring $3\frac{3}{4} \times \frac{1}{2}$ inches, into which the flaps were sewed with chromic gut. The canal was lined to a depth of three inches with mucosa. A glass plug four inches long was introduced and removed daily, the parts being douched each time. The bladder was artificially emptied five times daily. At the end of ten days the flaps were adherent and the result was satisfactory.

In Fleming's⁴⁷ case, in 1903, vagina, uterus, tubes and ovaries were absent, and the woman suffered from nervous symptoms and frequent headaches. His method of operating and securing flaps is very interesting. (Fig. VII.) (1) For the anterior

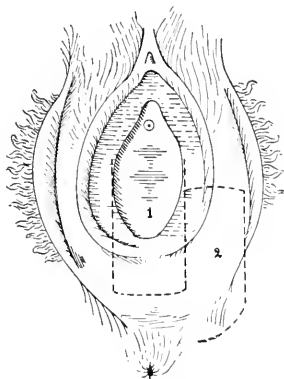


Fig. VII. Fleming's operation with flaps. 1, Anterior flap. 2, Posterior flap (*Fleming*).

flap he utilized the hymen, the posterior ends of the labia, and part of the integument over the perineum, leaving the flap attached above at a point just below the meatus urethrae. For the posterior flap he dissected away the integument covering the greater lip on one side, leaving it attached below just in front of the anus. By this method he obtained flaps as long and as wide as he wanted. (2) A transverse incision was made in the connective tissue of the rectovesical septum, which was brought into view after raising the anterior flap. A canal of sufficient depth was made by blunt dissection. (3) The flaps were inserted into the new canal and stitched to the con-

nective tissue beneath. (4) The denuded surfaces left after removal of the flaps were easily brought together and sewed. Union occurred by first intention. A year later the new vagina was an entire success. The author adds: "The nervous symptoms have disappeared, the headaches have been relieved, the sexual ability restored, and the home made happy."

Violet,⁴⁸ in 1904, reports an operation by Polosson on a case of cicatricial atresia of the vagina in a woman who had given birth to five children. After difficult blunt dissection in the scarred tissues the cervix was found and two lateral incisions were made in it. The anterior and posterior lips thus made were sewed to the vaginal lumen below. Later, "from its own elasticity," the uterus had ascended 2 or 3 cm., dragging upwards the mucosa to which it was attached. A year later it had ascended 5 or 6 cm., leaving a "perfectly comfortable canal."

Balzevitch,⁴⁹ in 1904, reports a case of congenital vaginal atresia in a woman who, after a year's marriage, was obliged to secure a divorce and enter a convent. She had menstruated two or three times in her life through a narrow vaginal canal, which barely permitted the passage of a fine sound. This was dilated gradually, until the small cervix was reached. Dilatation was later continued with the aid of a valve-speculum. After a time the patient was submitted to operation and the whole fibrous area exsected. The raw surface was covered over by drawing down the upper portion of the vagina and securing it to the lower portion—"as has been previously done by Delbet" and others.

Vantrin,⁵⁰ in 1903, operated upon a case of complete absence of the vagina, in which a small rudimentary uterus was present. He first bored through a hole for the new vagina. He then took two flaps from the thigh and, after lightly twisting them on their pedicles, he sutured them to the raw surface and to each other. A third flap was taken from the lesser lip to cover the gap left. The new vagina measured $8\frac{1}{2}$ cm., but in the course of three years it had shrunk to only 5 cm.

c. Methods by which Raw Surface Is Covered with Transplanted Skin or Mucous Membrane.

In 1887 Schalit⁵¹ transplanted five pieces of mucous membrane from the labia into the newly-made vaginal canal. In a later paper (1890) he gives the following description of his

technique. After constructing the canal, he covers a gutta-percha cylindrical speculum with gauze and leaves it *in situ* for twenty-four hours in order to check oozing, which is apt to interfere with the successful adhesion of the graft. This is removed and another gutta-percha speculum with fenestra in the sides and at its dome is introduced. The openings in the speculum are as wide as a finger's breadth. From the labia minora or majora grafts of mucous membrane (ranging between 0.5 and 2 cm.) are taken and placed on the raw surface through the little windows, with the aid of spatula and forceps, until the entire surface of the new canal is completely covered over. The speculum is now telescoped with a second unfenestrated, closely-fitting speculum, to prevent the grafts from falling out, and to keep them in close touch with the raw surface. Both specula are left *in situ* for several days, until the grafts have become adherent. In the case reported he thus transplanted ten grafts in two sittings. Eight weeks later the patient had a vaginal canal lined with mucous membrane, which measured 9 cm. in length and $2\frac{1}{2}$ cm. in width.

Independently and a year later, in 1888, Küstner⁵² secured two mucous membrane flaps from the intestine of another patient, synchronously operated on for artificial anus. The mucosa was first freed of its connective tissue and temporarily placed in a solution of chloride of sodium. After the new vagina was prepared in the second woman, the mucous strips were introduced and sewed to its walls. A month later a second transplantation was done on this woman, the grafts this time being obtained from the vagina of another patient who was having a colporrhaphy done. After a year and a half the scars were excised and a plastic operation was done with flaps secured from the posterior wall of the lower vagina. The final result was fairly good, a vagina 6 cm. in length being secured.

In 1892 Swentsitsky, ⁵³ had a patient with vaginal atresia following phlegmon of the perivaginal tissues and gangrene of the mucosa. The atresia resulted in hematometra for the relief of which he punctured the uterus. Later he transplanted the mucous membrane of the intestinal canal of a rabbit which was killed shortly before the operation, the grafts being washed in sodium chloride solution. This operation having met with failure, it was repeated two weeks later with this difference

"that the grafts were this time covered with a zinc plate." Six months later the result was satisfactory.

Mackenrodt,⁵⁴ in 1896 reported two successful cases of transplantation of vaginal mucosa obtained from other healthy women simultaneously undergoing plastic operations for prolapsus. He waited until healthy granulations were visible. Then the prolapsed vagina in the second patient was rendered aseptic by nonirritating methods. The grafts were obtained by cutting and dissection. They were secured smooth, thin, and with as little subvaginal connective tissue, as possible. After removal they were placed with their raw surfaces folded on each other in sterile warm watch-glasses until ready for use. For grafting the whole vagina, a Cusco speculum was covered with mucous strips lightly sewn together in the shape of a tube with openings for drainage. The new vagina was widely exposed by means of retractors, and the graft-covered speculum was introduced. The upper portion of the vaginal canal was packed with gauze, and the speculum was gradually withdrawn while more gauze was being introduced, until the entire vagina was packed and the speculum was entirely out of the canal. This tampon—only one piece of gauze having been used—was carefully removed after eight or ten days. The urine was drawn by catheter. Both operations were successful even to the extent of sensation being present in the transplanted mucosa.

Abbe,⁵⁵ in 1898, describes an interesting case of skin-grafting. (1) A crescentic incision was made across the interlabial space with the concavity upwards, thus getting a little shelf of mucous membrane below the urethra to direct escaping urine. (2) By blunt dissection a free cellular space was readily created between the bladder and the rectum to the depth of five inches. This was temporarily packed with gauze to check oozing. (3) Thiersch skin grafts were then cut from the thigh in sufficient quantity to cover the raw surface of the new canal. (4) A plug was made of a thin rubber pouch by stuffing it with strips of gauze. Upon this the skin grafts were spread with their wet surfaces outside and their edges freely overlapping. Numerous punctures had been previously made in the rubber pouch to absorb possible discharges. (5) A piece of gauze-covered rubber tubing was passed into the rectum to permit of the free exit of intestinal gases. (6) The graft-covered plug was carefully passed into the new vaginal canal, the walls of which were held

apart by three deep retractors which, on removal, allowed the fresh surfaces of the canal to come into closest contact with the wet surfaces of the grafts. (7) To prevent the plug from being displaced, two silkworm gut stitches were passed across the vulva transfixing the graft-covered tampon and tied over iodoform plugs placed at either side. The bowels were kept confined during ten days and the urine was drawn every eight hours. The later packings were smeared with lanolin so as not to interfere with the grafts. Dilatation was kept up later with vaginal plugs. Ten weeks later the patient married and kept dilating the canal herself with wax candles, because, when omitted, there was a tendency toward shrinkage of the new canal, which directly after the operation measured $4\frac{1}{2}$ inches in depth.

About the early part of May, 1904, through the courtesy of the operating surgeon, Dr. A. E. Isaacs,⁵⁶ the writer was permitted to examine a patient under anesthesia—a young married woman, 26 years old—and to confirm the diagnosis of complete congenital absence of vagina, uterus, and ovaries. Recognizing that in the construction of a new vagina the greatest difficulty lay in securing the attachment of grafts or flaps to the roof of the new vagina, and that, because of this difficulty, most of these cases ultimately tended to shrinkage of the new canal, Isaacs conceived the idea of displacing the interlabial mucocutaneous diaphragm into the deepest portion, or cupola of the new vagina, and covering over the raw surface between it and the vulvar aperture with transplanted Thiersch skin grafts. Pozzi, referring to this difficulty, says: "In spite of every care in the operation the primary result is maintained with difficulty, for the angle which forms the bottom of the cavity is very hard to cover with the graft, and, even when the graft has adhered well, there is an invincible tendency to draw the flap outward and gradually fill up the canal."

Isaacs proceeded on the following lines: (1) Beginning just below the urethra in front, an incision was carried in a circle over to and including almost the whole of the labia minora on both sides, and from there well outside the vaginal orifice and on to and across the perineum. This gave quite a large circle of skin and mucosa which, when loosened and pushed up into place, sufficed not only for the top of the cavity, but for a small distance down the sides as well. While the attach-

ments were being loosened with snips of scissors, a glass dilating speculum was pressed firmly against the interlabial partition and assisted very materially in tearing it away from its connective tissue attachments to bladder, rectum, and lateral pelvic walls. Thus gradually—after fifteen or twenty minutes—the whole length of the glass dilator (about three inches) entered the newly-made canal, with the diaphragm beyond the distal end. (2) While holding the dilator under tension against the vault, by tilting it to one side and retracting the margin of the vulvar orifice in the opposite direction, the gap of raw surface, one part at a time, was approachable for placing the Thiersch grafts, which were taken from the thigh of the patient. (3) From the time the grafting was begun until the end of the operation the glass dilator was held in position under tension against the vault and then strapped in place with long strips of adhesive plaster. The bladder was catheterized and the bowels were confined during five days, when the grafts were found to have taken, for the most part. For eighteen days the glass dilator was worn, and at the end of three months the vagina admitted two fingers to a depth of $2\frac{1}{2}$ inches.*

With Isaac's patient fresh in the writer's mind, chance threw the exact counterpart of the case in his own way a few months later in the shape of a young woman of 21 years, who turned up at one of his outdoor clinics. The history she gave was as follows:

Born in this country, but of French descent, she was one of four children, none of whom presented any congenital defects or anomalies. Never very strong, she had never been sick with anything more than a weak stomach. Although she had never menstruated, she married two years previously, but her husband had deserted her after eighteen months' marital experience. The stomach bothered her by causing weak, painful spells, with headaches and heavy sensations over the stomach, which had become more frequent after her marriage. She had married her husband for love, and looked forward to the con-

*After the lapse of six months Isaac writes, "External appearance of genitals normal. Canal takes two fingers easily for $2\frac{3}{4}$ inches. On introducing the fingers the vault is encountered at about $1\frac{3}{4}$ inches but gives way without any resistance or sensation of pressure to the patient for another inch. This slight sagging of the vault is evidently due to absence of support from above. To the patient the results of the operation are entirely satisfactory."—Private Communication.

jugal act with a sense of pleasure, although intercourse was painful and she never experienced any distinct orgasm.

The patient presented a girlish build, with nipples and mammary glands fairly well developed. The inspection of the vulva showed a small clitoris, urethra, and well-developed labia majora, nymphæ and fourchette. The hymen was not found and the vagina was represented by a quasi-mucous membrane diaphragm, which could be depressed to a distance of a little more than an inch. With the sound in the bladder and finger in the rectum, contact of both occurred at a depth of about an inch. Careful and repeated examinations failed to discover any distinct evidence of uterus, tubes, or ovaries. The hand on

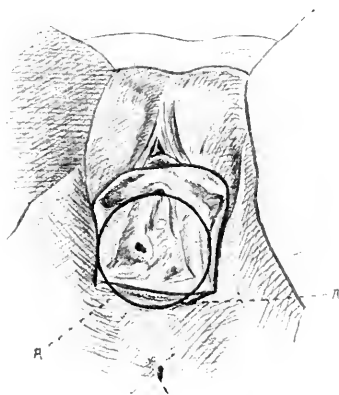


Fig. VIII. Isaacs' modification employed in the Author's case. The circle of tissue (A A) is displaced upwards and constitutes the roof of the future vagina.

the abdomen, under anesthesia and without it, could be easily made to touch the finger below at the interlabial diaphragm, indicating a very short distance between the vulvar aperture and the peritoneal cavity.

On July 1, 1905, the writer proceeded to operate upon this patient after Isaacs' plan. (Fig. VIII.)

Beginning just below the meatus urethræ, the incision was carried in a circular manner across to the labium minus, down to the perineum and upwards on the opposite side to the starting point. This circle of quasi-mucous membrane was dissected away in part at its circumference and presented the firmest attachment to the urethra and bladder with lesser ad-

hesions to the lateral regions and rectum. Neither catheter in the bladder nor finger in the rectum was deemed necessary at any stage of the operation. Several bleeding points at the sides were readily controlled by ligatures or torsion.

With Sims' glass dilator ($1\frac{1}{2} \times 4$ inches) the diaphragm was firmly pressed against, so that, by dint of snipping in the surrounding connective tissue and considerable pressure against the dilator, the saucer of mucosa was pushed upwards to the full length of the dilator, leaving a cylindrical gap of raw tissue below it. Whilst the dilator was kept under tension and pressed firmly against the vaginal vault, an assistant secured Thiersch skin grafts from the inner side of the patient's thigh, which were placed over the raw surface by tilting the dilator in different directions. (Fig. IX.) At the completion of the operation the dilator was surrounded at its vulvar end with gauze and re-

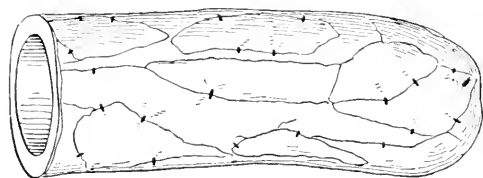


Fig. IX. Glass tube covered with iodoform gauze and rubber pouch to which grafts were attached.

tained in position under tension by means of long strips of adhesive plaster secured to the buttock and abdomen to prevent the disarrangement of the grafts. (Fig. X.) A permanent catheter was left in the bladder and the bowels were kept constipated during five or six days. At the end of this time the dilator was removed, when it was found that a ring of grafts had become adherent within the vaginal canal to a depth varying between $\frac{1}{2}$ inch and $\frac{3}{4}$ inch. The mucous membrane at the vault looked normal, but there was a raw gap between the two. Suggestions to repeat the grafting over this area were met with refusal on the part of the patient, especially as there seemed to be some prospect of the gap being gradually covered over by the growth of the new skin. She was kept in the hospital for a month, the vaginal canal was kept patent by means of a glass dilator which measured $1\frac{1}{8} \times 4$ inches. This was kept in

place by a stem perforating a cork closing up the open end of the glass dilator. Through the stem two rubber tubes passed antero-posteriorly and were secured to an abdominal belt on the principle of a McIntosh uterine supporter. This the patient wore with perfect comfort continually night and day, and she left the hospital with instructions to keep on wearing it during a protracted period of time. When examined at this time, two fingers easily passed in to a depth of four inches, and the result was regarded as very encouraging.

On August 18, the patient was still wearing her glass plug without any discomfort to its full depth (four inches) night and day. There was not much progress in the extension of the new skin upwards, so that we advised her to return to the hospital

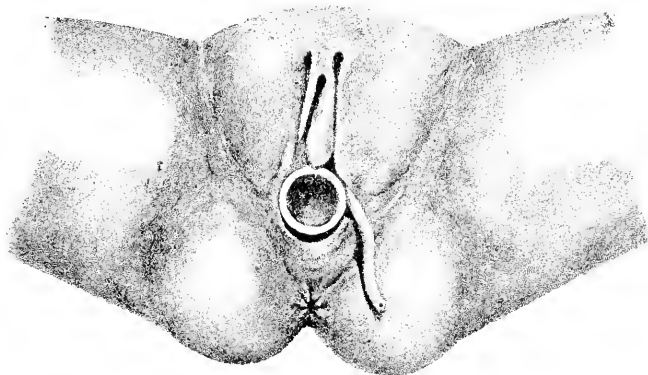


Fig. X. Drawn at completion of operation for artificial vagina, by Dr. H. C. Carrington, Aug. 29, 1905.

and have the raw surface still present covered with grafts. The posterior vaginal surface presented an area of one inch in depth covered by the new skin and two fingers passed readily to a depth of four inches.

On August 29, under anesthesia, the vaginal granulating surface was thoroughly curetted and temporarily packed with gauze to check the bleeding. A cylinder had been prepared in the following manner. A glass dilator measuring $\frac{1}{2}$ inch in diameter and 3 inches in length was carefully and smoothly covered over with iodoform bandage, until its diameter measured one inch. Over this a thin rubber pouch was snugly drawn and then perforated at numerous points so as to permit

the absorption of discharges. On this cylinder grafts of thin skin, secured by a razor from the left thigh, were placed with the raw surface exposed and secured by means of fine catgut. Excepting the two extremities of the cylinder, the entire surface was thus covered over with new skin.

The vagina was now thoroughly exposed (after removing the gauze) by means of three deep and narrow-bladed retractors, and the graft-covered plug was introduced. By carefully withdrawing each retractor, exerting pressure centrifugally during the process, the plug was left in the canal with the raw surfaces of the grafts in intimate juxtaposition with the raw vaginal wall.

A self-retaining catheter in the bladder and plaster strips retaining the gauze-covered plug *in situ* completed the operation. The bowels were kept confined with opiates and the patient rigidly maintained the horizontal decubitus during seven days.

At the end of this time the plug was removed and, with the exception of a small area in the left side of the vaginal floor, the entire canal was covered with smooth epithelium. The retention catheter was removed, the bowels were moved and a glass plug (three inches in depth) was secured in place with the McIntosh supporting apparatus. No attempt was made to use a longer or wider tube for fear of disturbing the grafts, some of which had loose ends.

On June 29, 1906 (just one year after the first intervention), the writer had an opportunity of re-examining the patient. After leaving the hospital she had worn the glass speculum during a period of two months and had then discarded it. She had been living continually with her husband since then. She described him as of large build sexually. Intercourse had been maintained several times weekly to the complete satisfaction of both parties. She claimed even that she frequently had orgasms as the result of coitus.

Locally a sagging downward of the new vagina was quite noticeable. Introducing two fingers the vagina was found to be quite distensible, permitting them easily and painlessly to be introduced to a depth of $3\frac{1}{2}$ inches. A glass speculum of one inch diameter was similarly easily introduced to a depth of three inches. Altogether the woman was very grateful and satisfied with the result obtained.

After the writer's experience with the two cases referred to, he would offer the following suggestions or modifications:

- (1) That a large circle of tissue around the vulvar orifice be

dissected beyond the labia minora and intervulvoanal integument, and pushed up toward the vault of the future vaginal canal. This will not only give a permanent roof (with its normal attachments above), but the sides and posterior surface will be provided with long, loose flaps which, under the pressure of the glass plug, will readily adhere and leave less of a raw surface to be covered by transplanted grafts below.

(2) The transplantation may be done immediately, but may also be delayed a few days. The latter plan is better, because the tension of the glass plug will have exerted its influence, during this time, to advantage.

(3) The "tilting" of the glass dilator under great tension renders the raw surface to be covered with grafts difficult of access. Much better and simpler is the plan followed in the writer's second operation, in which a graft-covered plug was deliberately prepared and then inserted into the vaginal canal. This might be done with a second glass plug at hand at the time of the primary operation. The writer would avoid, in future, using any sutures to the plug, as the grafts ought to adhere without them, and the sutures are not always softened and loosened up, even at the end of a week. If a perforated glass plug (which ought to absorb secretions better) can be procured, it will insure the result with greater certainty.

(4) The permanent catheter is vastly preferable to the ordinary method of passing a catheter at intervals.

(5) Ten days should elapse (rather than five), before the first dressing is changed, even if the parts acquire an odor.

This operation is practically a combination of the flap and transplantation methods.

II. *Per Vaginam Combined with Vaginal Celiotomy.*

Czempin,⁵⁷ in 1896, reports the following case. The patient was 23 years old and gave a history of menstrual molimina. The vagina was absent, but the urethral canal was dilated. One tube and one ovary with a rudimentary uterus were present. After incising the septum between the bladder and rectum, he opened into the peritoneal cavity and removed the uterus with the functioning ovary. He then narrowed the urethra by suturing a longitudinal fold along its inferior border. The vagina was then tamponed with gauze for a week until the peritoneal wound was closed. He then transplanted Thiersch

grafts of tissue-paper thickness, taken from the thigh. The operation was successful.

V. Ott,⁵⁸ in 1897, operated on a patient of Sitsinsky by deliberately opening up the peritoneal cavity from below. Without a trace of a rudimentary vagina the patient had a fibroid uterus (mistaken for hematometra) with normal ovaries. The vaginal septum could be depressed about 3 cm. After splitting the septum, two flaps were secured and pushed aside. The deep tissues were opened up by blunt dissection down to the anterior fold of Douglas' pouch. The peritoneal cavity was now deliberately opened for the purpose of digital exploration when the fibroid uterus with normal ovaries was definitely made out. The uterus was removed by morcellation but the ovaries were left. The two flaps made in the beginning of the operation were now sewed to the edges of the peritoneal wound and the new canal was packed with gauze. At the end of a week the intraperitoneal opening was still apparent. At the end of 28 days the patient left her bed. At the end of two months the case presented appearances identical with those after vaginal hysterectomy. One and a half years later the canal was still in the same condition. Sitsinsky—who, by the way, has written one of the best and most exhaustive papers on the operative treatment of the absent vagina—considers this to be the ideal method.

Reid,⁸³ in his text-book, takes the same view.

Walton,⁵⁹ in 1898, saw a girl of 25 who had never menstruated, but had suffered frequently from epistaxis and abdominal cramps. She had been operated on three years previously without benefit. Separating the labia minora, an infundibulum of mucosa was encountered which admitted the finger down to a transverse cicatrix left after the former operation. The left ovary with an atrophied uterus was mapped out. No trace of a fibrous cord indicating the possibility of a rudimentary vagina could be discovered. The girl was anxious to marry and readily consented to operative intervention. The operation was done in the following manner:

(1) After seizing the vaginal infundibulum in two forceps laterally, an H-incision was made with the vertical sections over the bases of the labia minora, and 6 cm. long. Both flaps were carefully dissected away—the lower one opening up the vulvoanal region, the upper one dissecting the mucosa of the

vestibule. The parallel incisions were continued beneath the mucosa of the labia minora, unraveling the folds of these lips. He thus secured two additional lateral flaps, 7 or 8 cm. in length.

(2) By blunt dissection upwards the uterus was sought for, but could not be found. The pouch of Douglas was then deliberately opened up. The examining finger was introduced into the peritoneal cavity and the rudimentary uterus (the size of a large chestnut) was readily located. The right ovary was found to be well developed, but the left ovary was hardly larger than a coffee bean. The cervix was represented by a fibrous tract as broad as a pencil, 2 or 3 cm. long, which became lost in the vesicorectal bridge.

(3) The cervix, with its imperforate os, was dissected out of the surrounding cicatrix. The lowest portion—about one cm.—was removed by amputation which permitted a little black blood to escape from the uterine interior. The uterus measured 4 cm. in depth. The cervical opening was next split bilaterally, so that two valves resulted. The peritoneal cavity was now sewed up.

(4) The uterus, being now freely movable, could be easily brought down to the vulva. The anterior and posterior vulvar flaps were sewed to the vivified cervix. The unraveled labia minora were sutured to the other two flaps (like a glove-finger) above and below. Laterally, in the depths, two raw spaces remained, but healing was complete after three weeks. The new vagina was kept packed with gauze and left a canal 7 to 8 cm. deep.

III. *Per Vaginam Combined with, Preceded by, or Followed by Abdominal Section.*

Quite a number of surgeons have preferred laparotomy at different times in connection with work from below in cases of absent vagina.

Webster,⁶⁰ in 1895, had a girl of 21, who had menstrual crisis with hematometra and atresia of the vagina. He made first an artificial vagina, large enough to hold two fingers, and then opened up the uterine cavity, allowing the retained blood to escape. After doing nicely for a time, the patient had a relapse. Abdominal section was now done, at which a "cystic mass" was removed. The patient recovered.

In one of Rossa's⁸⁴ cases, in 1894, a woman, 58 years of age, with acquired vaginal atresia (the result of carcinoma of the

cervix uteri and vagina) developed a pyocolpos and pyometra in a uterus bicornis unicollis. The vaginal canal beyond 1 cm. was completely obliterated, and above it were the retention tumors containing purulent liquid. An abdominal section was done, exposing the intrapelvic masses fully to the sense of sight, after which a puncture with a thin cannula was made through the atresic vagina, allowing fully one liter of liquid to escape. The abdominal wound was closed and provision was made for drainage at the site of the vaginal puncture. The patient died five days later, and the autopsy showed that the uremia which caused her death was due to a hydronephrosis of and pressure on the only ureter and kidney which the woman had.

Hollander,⁶¹ in 1896, after a girl had been subjected to a number of laparotomies, decided to build a new vagina for her. He made a transverse incision through muscle and skin to the tuber ischii and discovered the remains of a rudimentary vagina, the edges of which he freshened up. Taking two large flaps from the gluteal region and right greater lip, he sewed them into the new canal. He reports the result as good.

Tucker,⁶² in 1897, describes the history of a married woman of 23, who had had periodic attacks of diarrhea. Although she had sexual desires, there was present only an infantile uterus, "the size of a hazel-nut," a single ovary, and a cordlike body representing the rudimentary vagina. A doctor, in attempting to overcome the vaginal atresia, made an opening into the rectum. Tucker first operated on the fistula, which he closed. Then he did a laparotomy and removed the ovary. Two months later he proceeded to operate on the vagina. He made the usual transverse incision and dissected up a space of $3\frac{1}{2}$ inches. This was packed with gauze during forty-eight hours. After this a glass dilator was worn. Every three or four days the new canal was stretched with a rectal speculum. The patient left the hospital wearing the glass dilator which measured $4\frac{1}{2} \times 1\frac{1}{4}$ inches. The final result is not given—but may be inferred.

Pfannenstiel (quoted by Vineberg, AMER. JOUR. OBST., April, 1906, page 518) reported the following case in 1902. A young woman, 21 years of age, had never menstruated. The vagina formed a blind sac, $\frac{1}{2}$ cm. deep and, under narcosis, uterus and adnexa could be discovered. Blunt dissection through the blind vagina was made in an upward direction for a distance of 5 or 6 cm. until the portio, covered by a membrane

was reached. For fear of injuring the bladder the abdomen was opened and the anterior wall of the uterus incised. Separating bladder from uterus, the upper vagina was entered through an incision in front of the rudimentary and closed cervix. A sound was passed through the opening in the uterus and forced through the closed os until it emerged at the vulva. A ligature was tied about the end of the sound to serve as a guide to the opening in the true vagina. After closing peritoneal, uterine, and abdominal wounds the upper segment of vagina was sewed to the mucous membrane forming the blind sac. Three years later the vagina readily admitted the index finger to its full length.

Heinricius is quoted by Engstrom in 1902 (*vide ibid.*) as having performed a laparotomy in a similar case, cut into the true vagina behind the cervix and pushed a blunt instrument towards the vulva. In doing this, however, he injured the bladder.

Broca,⁶³ in 1900, in a case of partial vaginal atresia, which interfered with the escape of menstrual blood, tried to remove the obstruction by two operations, both of which failed. At the end of five years' observation he was obliged to perform a celiotomy and remove both tubes and ovaries.

Oui,⁶⁴ in 1903, met a case of congenital absence of the vagina, hematometra and hematosalpinx. After separating the vaginal tissues "in the line of cleavage" with the fingers, it was not possible to seize the cervix. In order to gain more room, a posterolateral incision at the vulva was made. A little membrane was discovered in front of the cervix. This was perforated with scissors. The cervix was now seized and its canal dilated, allowing blood to escape from the uterus. The vaginal passage was tamponed and the vulvar incision closed with sutures. Although the new canal admitted a small Cusco speculum, and an effort was made to keep it open by means of dilatation, it closed up rapidly. Later Oui performed a laparotomy and removed the uterus. He is honest enough to confess his error in not doing autoplasic work at the first operation.

Villemin,⁶⁵ in 1903, operated upon a girl of 15 for imperforate vagina with blood retention, which worked its way backwards into the uterus and tube. He first punctured through the bridge of obstructing tissue in the vagina. The relief was not permanent, however, so that he was obliged later to

do a laparotomy with the removal of the offending organs. The pent-up blood, by this time, showed a purulent character. After a month the girl recovered.

Tuffier,⁶⁶ in 1904, described a method by which he utilized the abdominal transperitoneal route with the distinct object of constructing a permanent vaginal canal in cases of cervico-vaginal imperforation. He reported two cases.

CASE I.—The uterus reached down to within 2 or 3 cm. of the vaginal orifice. Abdominal section was done and the uterus was found fixed by adhesions which were easily broken up. Cutting through the peritoneum between bladder and uterus, the cervix was reached and its canal opened. With a sound passed through the cervical opening, the vaginal cul-de-sac was felt and the opposing bridge of tissue cut through on the sound as a guide. Skin grafts from the arm were sewed around a catheter and through the abdominal wound passed down into the new vaginal canal. The cervical wound was then sewed over the catheter at its upper end and the abdominal wound closed with sutures. Three days later the catheter was removed from below. The patient was cured—the new canal, at last accounts, permitting of the easy passage of a No. 30 bougie.

CASE II.—This was a girl of 23 years, with rudimentary uterus and complete absence of vagina. Laparotomy discovered the uterus, left tube, and ovary in one mass. There was no sign of the right tube, or ovary. The uterine cavity was opened in the median line. An incision was made in the vagina and forceps passed up into the uterine cavity. A skin flap from the left thigh was rolled and sewed around a No. 26 sound, with its raw surface exposed. This was drawn through the exposed uterine cavity into the raw vaginal canal and sutured to the vagina and to the uterus. The uterine wound was closed. The abdominal wound was also closed, excepting that it was thought wise to leave a drain at its lower angle. Four days later the sound was removed and others were passed. The ultimate result was a canal sufficient for the purposes of menstruation.

Hofmeier,⁶⁷ who, in 1904, performed a similar operation, attributes its first performance to Pfannenstiël. According to this method the abdomen is opened, the peritoneum between the bladder and the uterus is divided and these two organs are

separated from one another. With the hand assisting from below, a new canal is formed reaching to the vulva. After opening up the uterus, it is drawn down and sewed to the rudimentary vagina.

Hofmeier's patient was a girl of 19 years, who had never menstruated. She presented a condition of hematometra with complete atresia of the vagina. Although the hymen was

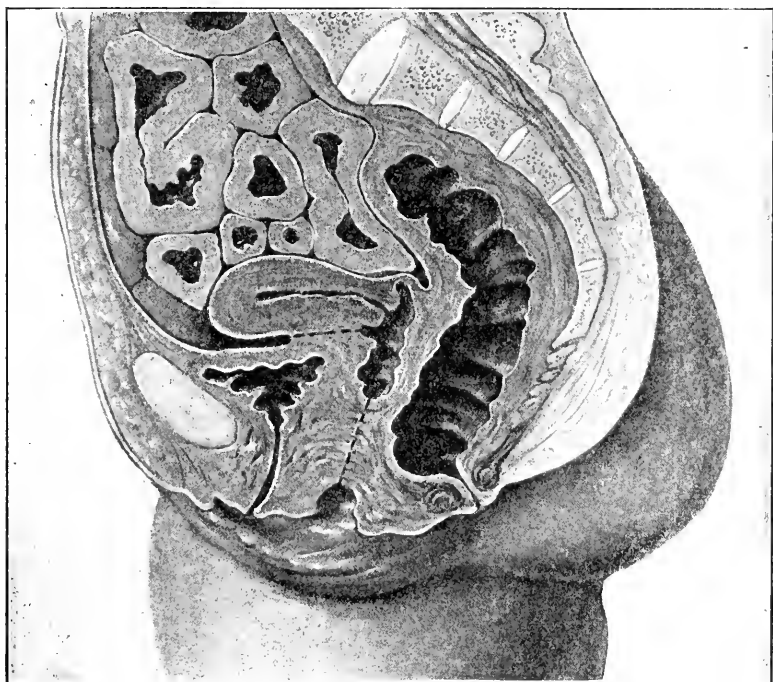


Fig. XI. Vineberg's case. Boring passage to upper segment of vagina

present, the vagina was rudimentary, very narrow, and only $1\frac{1}{2}$ cm. deep. Per rectum and 6 cm. above the constriction the uterus with normal adnexa could be felt. He adds that few cases of this kind have been described. The following are the steps of the operation which he performed:

(1) He made a transverse incision through the rudimentary vagina. (2) The space between bladder and rectum was opened up by blunt dissection for a distance of 4 or 5 cm. (3) Celiotomy

was now done and the peritoneum in front of the distended cervix was divided transversely, separating it from the bladder. (4) The cervix was opened up longitudinally, permitting a half ounce of thick bloody mucus to escape. (5) The artificial vaginal canal (the width of two fingers) was made to open into the peritoneal cavity between cervix and bladder. (6)

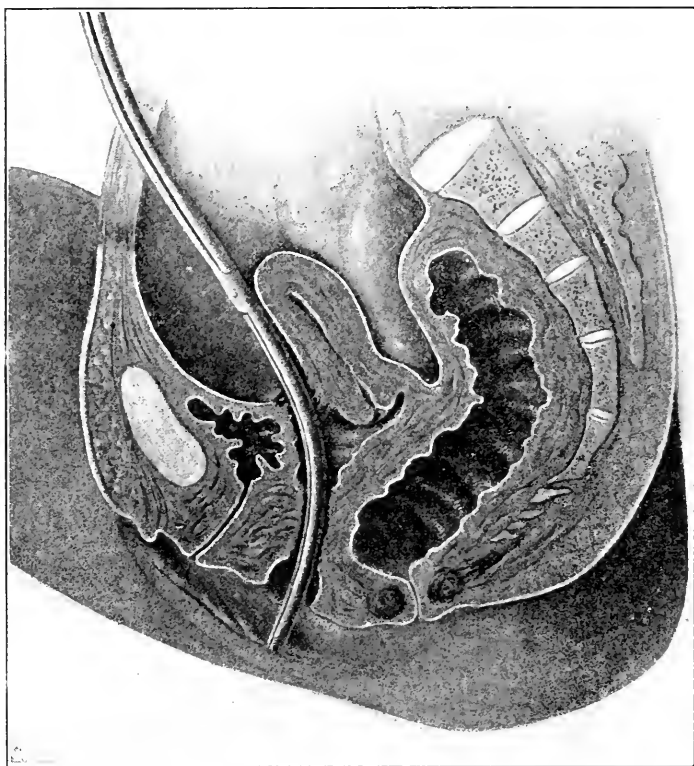


Fig XII. Vineberg's case. Dressing forceps introduced through abdominal incision between bladder and uterus down to vulva.

Passing two silk sutures through the margins of the wound in the cervix, the uterus was drawn down into the new vagina. (7) Sutures approximated the three wounds—in the upper portion of the cervical incision, in the peritoneum between uterus and bladder, and in the abdominal wall. (8) The margins of the new cervical opening were sewed to the upper portion of the

rudimentary vagina with silk sutures. The operation was very difficult and at its close yielded a vaginal canal through which only a uterine sound could be passed. He saved the patient, however, from being castrated.

Vineberg, in the *AMERICAN JOURNAL OF OBSTETRICS*, April, 1906, reports a similar case under the title: "Congenital Absence

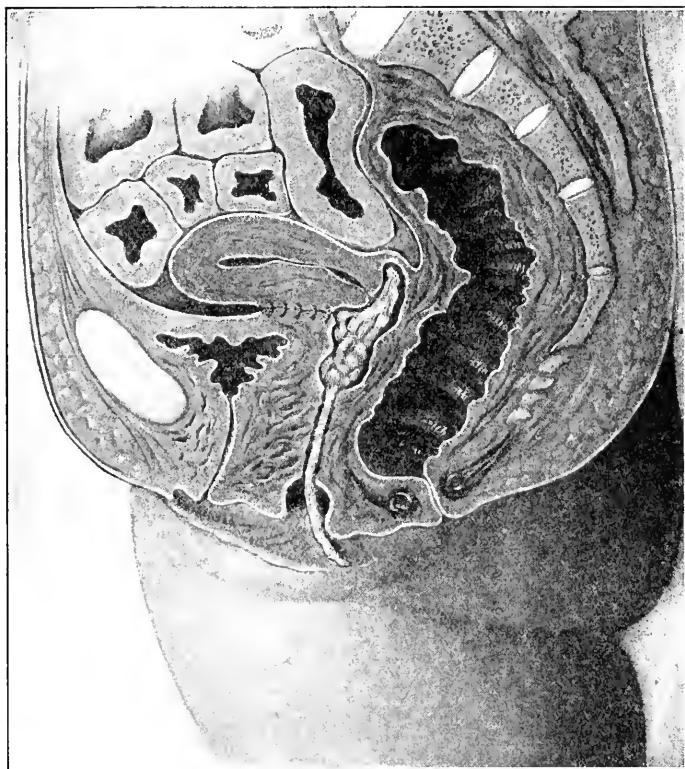


Fig. XIII. Vineberg's case. Closure of abdominal and anterior cul-de-sac wounds and packing of new vagina with gauze.

of Lower Third of the Vagina, a Shallow, Blind Sac Occupying the Vaginal Introitus. The Creation of a Continuous Vagina, Partly by the Vulvar and Partly by the Abdominal Route."

The patient was 24 years old and married three months. Without knowing of previous operations on the same lines, he unconsciously followed practically the steps of Pfannenstiel in the

construction of a new vagina. The operation is well illustrated in Vineberg's paper. (Figs. XI, XII, XIII.) Five months later the index and middle fingers could be readily inserted to their full length, "and anyone making the examination for the first time would scarcely believe that there had been a malformation."

IV. *Per Vaginam, Utilizing the Rectum or Sigmoid Flexure.*

Sneguireff,⁶⁸ in 1892, constructed a new vagina by utilizing the entire lower portion of the rectum, including the anus. The result was perfect and lasting. Coitus became possible and was perfectly satisfactory twelve years later. The newly-formed anus performed its functions normally. He reports (1904) two additional cases which were likewise successful. The operation he describes as follows: (Fig. XIV.)

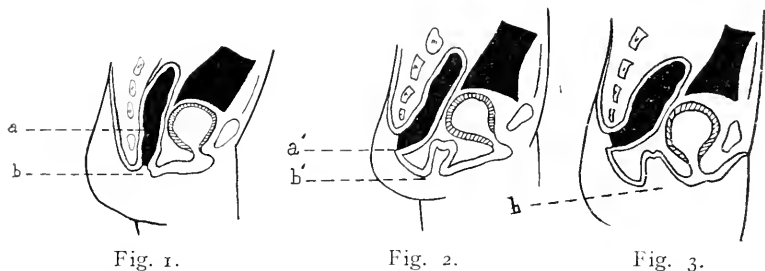


Fig. XIV. Sneguireff's operation for the creation of a new vagina (*Sneguireff*).

Fig. 1. a, Line of division of rectum through sacral incision; b, anus.

Fig. 2. a', Site of new anus; b', lower segment of rectum closed at upper end.

Fig. 3. b, Anus and perineum split in anterior direction.

(1) With the patient in the right-sided decubitus the limbs are bent and drawn up. An incision is made through the skin and deeper layers along the left edge of the sacrum and coccyx to the tip of the latter. Removal of the coccyx. Blunt separation of the rectum from the anterior surface of the sacrum with the finger. It is then isolated until three inches are thoroughly separated from adjacent structures. (This was not possible on the bladder attachment.) The rectum is next drawn out of the wound and cut away entirely above. (2) The lower segment, after inversion of its upper margin, is closed with a continuous suture and left in its original, normal situation. This segment constitutes the new vagina. (3) The upper segment is sewed into the opening left by the removal

of the coccyx. It is surrounded by the usual muscular insertions of this region, so that the fibers of the levator ani do the work of the sphincter ani. (4) The patient is turned onto her back, with the pelvis elevated. The knife introduced into the anus and directed forwards, splits the perineum completely, until the blade has opened into the blind vaginal pouch, when the mucosa of the latter is sewed on each side to the mucosa of the anus and rectum. The result very closely resembles the normal vaginal canal. For six days the bowels are kept artificially constipated; after that, daily evacuations.

After seven days the sutures were removed. The new canal admitted the finger to a depth of $3\frac{1}{2}$ inches. The vulva had a gaping appearance.

In the three cases operated on, Sneguireff states that the patients had involuntary passages of flatus and liquid stools for a month, after which the stools were normal.

Gersuny,⁶⁹ in 1897, reports three successful cases operated on by his method. The steps of his operation are as follows: (1) Median splitting of the perineum and anus. From the anterior wall of the ampulla recti a longitudinal section 10 cm. long by 3 cm. wide is cut and left attached in its normal relations to bladder and urethra in front and to the peritoneum of the rectovesical pouch above. (2) Dissecting outwards from the wound edges the rectum is rendered mobile and displaced backwards so as to make room for the new vagina. The gap left in the anterior wall of the rectum, after exsecting the longitudinal section above referred to, is closed by sutures passed from without its lumen and in several layers. The sphincter is not entirely united so as to render healing of the rectal wound more certain. (3) After sewing up the perineum, there remains between the bladder and the rectum a tubular wound which is covered anteriorly with the longitudinal strip of mucosa exsected from the rectal wall. This strip is continuous above with the peritoneum and further down in front with the bladder which rests against it. It does not, however, extend as far down as the vulva. (4) The operation is completed by placing epidermic grafts over the entire raw surface left in the new vagina. A mucilaged cylindrical tampon covered with gutta-percha tissue is moistened and rolled over a sheet of similar tissue, on which 4 x 10 cm. of fresh grafts have been spread with their raw surfaces looking downwards. This tampon

is passed into the vaginal canal with the raw surfaces of the grafts in apposition with the raw vaginal surface and is not disturbed for five days. At the end of this time union has taken place and the patient is in possession of a permanent vaginal canal.

Baldwin,⁷⁰ in 1904, conceived the following operation, based somewhat on the same principles, but involving the opening up of the peritoneal cavity above and below. His patient was a woman of 19, who had been delivered by craniotomy, after which there was sloughing of the entire vagina. The resulting atresia obliterated completely the vaginal lumen, so that the smallest probe could not be passed into the small sinus left. At the time of the operation (Fig. XV.) he dissected the space

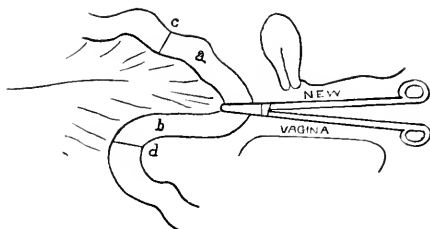


Fig. 1.

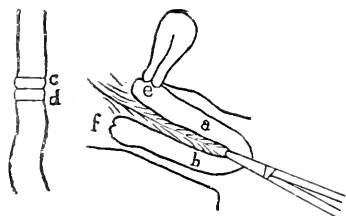


Fig. 2.

Fig. XV. Baldwin's operation utilizing sigmoid flexure.

Fig. 1. a, b, sigmoid; c, d, points for section. Fig. 2 a, b, sigmoid drawn into new vagina; c, d, anastomosis; e, attachment of one end to cervix; f, closed end (Baldwin).

between the bladder and rectum without finding a trace of the vaginal wall anywhere. He finally reached the uterus, but could not distinguish the cervix, which seemed to have sloughed away with the vagina. He opened up Douglas' cul-de-sac and was able to outline thoroughly the lower segment of the uterus. The opening was packed with gauze in the expectation of doing a second operation at a later date for the maintenance of the new canal. The patient, however, refused to submit and was subsequently treated by another physician with glass plugs.

The second stage of the operation which he projected, he was able to do in part on the body of an adult male a few minutes after death and while the parts were still in practically a living condition. He opened the abdomen and seized the central portion of the sigmoid flexure in a pair of forceps introduced from below through the new canal between the bladder and

rectum and drew it down to the perineum. He then detached this portion of the bowel by two transverse sections without injuring the vessels in the mesocolon. The continuity of the colon was at once restored by an anastomosis. One end of the excised loop was now closed by a continuous suture after inversion and without penetrating the mucosa. By pulling up the fundus of the uterus until the cervix was exposed in Douglas' cul-de-sac, the other end of the bowel was to be attached around the cervix by interrupted sutures, so as to form a canal for the uterine discharges. The abdominal wound was to be next closed in the usual way, with drainage through the new canal. Finally, with the patient in the lithotomy position, the loop of bowel still held in the bite of the forceps was to be opened, the interior of the bowel cleansed, if necessary, each limb of the loop packed with gauze and the edges of the opening in the bowel attached to the surrounding skin. At the completion of the operation there would be a double vagina, with its nutrition provided for by the integrity of the mesocolon. After ten days or two weeks the septum between the vaginae could be easily removed by clamp pressure.

J. J. Federow, in the *Zentralblatt für Gynäkologie*, May 19, 1906, describes what he considers a new operation for constructing an artificial vagina. His patient was 43 years old and married five months. There was complete absence of vagina, uterus, and ovaries. The operation consisted in utilizing a portion of the rectal wall in the construction of the new vagina. The writer was unable to get a clear conception of the operative procedure from the published description. The immediate result of the operation was apparently satisfactory.

V. *Abdominal Section.*

No attempt is made to record all of the laparotomies done in connection with the absent vagina, as the main purpose of this paper is to show how human ingenuity has been at work to overcome a defect of Nature which, at first sight, seems insuperable. Many surgeons, even at the present day, have taken the same pessimistic view and have been opposed to all efforts which aim at the construction of a new canal (Schroeder, Hegar, Kaltenbach, Pozzi). Howard A. Kelly⁷¹ says: 'It is also useless to attempt to form a deep pocket between the rectum and bladder simply for sexual purposes, as such an opening cannot be maintained.'

In cases of hematosalpinx, due to vaginal atresia, the principle is universally accepted that laparotomy with removal of the blood-filled tube alone or with the uterus is the proper course to pursue, whether simultaneous or subsequent efforts to build a new vaginal canal and overcome the vaginal obstruction are to be instituted or not. Thus Webster,⁷² in 1895, had a case in which the vagina consisted only of a diaphragm with nothing beyond. Laparotomy disclosed backward stasis of blood in the uterus and Fallopian tube. The patient died after the operation. In Rossa's⁷³ case (1896), in which a fatal celiotomy was done under double salpingo-oophorectomy and supravaginal amputation of an atresic uterus, there was a congenital defect of the upper portion of the vagina and the entire cervix was missing. The vagina ended in a blind pouch at a depth of 5 or 6 cm., beyond which, per rectum, an elastic tense tumor was felt. Although the hematometra was inconsiderable, still there were marked bilateral hematosalpinx and hemorrhagic cystic degeneration of the ovaries with extensive adhesive peritonitis.

In 1896 Säger⁸⁵ operated on a girl of 16, who suffered from monthly molimina. The vagina ended in a blind pouch at a depth of 2 or 3 cm., beyond which there were hematotrachelos and hematometra. An attempt to reach the blood collection from below seemed to endanger the rectum. Two months later celiotomy was done. There was free blood in the peritoneal cavity, although the uterus itself was not enlarged. The cervix was distended to the size of a small apple. A second attempt, working simultaneously from above and below to reach the retention tumor, met with failure. Both tubes were somewhat dilated and contained blood. The ovaries were small and the seat of oophoritis and perioophoritis chronica. With the exception of a rectovaginal fistula, which healed of its own accord, the patient recovered, and her menstrual colics ceased. Except in cases of hymeneal atresia with free outlet for pent-up collections of blood after an opening is made, Säger and Rossa advise primary celiotomy in all cases in which a sactosalpinx hæmorrhagica is suspected.

Lawrence,⁷⁴ in 1900, projected the removal of the ovaries in a similar case of vaginal absence to cure the patient of aggravated hysteria.

Engström,⁷⁵ in 1903, in a case of blood retention in the tubo-

uterine canal with defect in the vagina, extirpated half of the uterus and the whole affected tube and ignipunctured the ovary.

Picqué,⁷⁶ in 1904, operated on a young girl who had never menstruated, but suffered monthly from crises of abdominal pains and various nervous phenomena. On doing abdominal section for the large tumor present, he found a left-sided hemato-salpinx, with the uterus and upper third of the vagina distended with blood. The lower two-thirds of the vagina were completely missing. He did a supravaginal hysterectomy and the patient recovered.

Howard A. Kelly⁷⁷ performed a successful celiotomy for the removal of the undeveloped uterus, ovaries, and tubes in a case of total absence of the vagina and uterine cervix. The patient was 28 years old and had experienced menstrual molimina, ovarian cramps, convulsions, and rectal vicarious discharges.

Further narratives of similar cases would have no purpose in this paper. These few examples indicate the nature of some of the most prominent conditions which may be associated with or result from imperforation of the vagina, and which, when present, place celiotomy in the first place and the construction of a new canal in the second place. The possibility of their occurrence makes it desirable to take steps, as soon as the diagnosis has been made, to overcome the vaginal defect in order to anticipate the dangers of the future. Indeed, authorities like Emmet have stated distinctly that the construction of a new vaginal canal tends to develop the uterus and adnexa.

(To be concluded.)

ARTIFICIAL RENAL COLIC AS A VALUABLE MEANS OF DIAGNOSIS.

BY

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IN a paper read before the American Gynecological Society in May, 1899, and later published in the AMERICAN JOURNAL OF OBSTETRICS, Vol. XL., 1899, Dr. H. A. Kelly brought forward a method of determining the seat of obscure pain in the side by

producing an artificial renal colic by forced injection of the renal pelvis. At this time six cases had been investigated in this manner and these cases were reported in full. Since this report was published, over 150 patients, all women, in Dr. Kelly's Private Sanitarium and in the Gynecological Clinic of the Johns Hopkins Hospital, have been examined in this manner and 100 of these have been selected for study on account of the careful records which have been kept. The following report will show the results obtained from a study and analysis of this century of cases.

Need of a Method.—The need of a good method of correctly determining the origin and cause of obscure pains in the abdomen, sides, and back is evident. Frequently patients complain of pains, indefinite in location and in character, but for which there must be some rational cause. If the pains are somewhat vague, not acute, and not accompanied by constitutional symptoms, these patients are not infrequently classed as "neurasthenics," are given a tonic, and no further attention is paid to their complaints. A careful study of such cases will nearly always reveal a definite cause and origin of the pain. Any rational method of examination is valuable which may help to clear up these oftentimes important cases.

Location and Character of Pain.—It is difficult to classify pains as indefinite as those of which we are speaking, but some attempt at a classification may be made.

I. First there are those definite, sharp, acute attacks of pain which the patient can readily locate by placing her hand on the "painful spot." Such a "spot" is frequently situated in the angle between the twelfth rib and the quadratus lumborum muscle—the "superior lumbar triangle," pointed out first by Dr. Kelly as a vantage point in approaching the kidney in the operation of nephropexy or nephrectomy. This point lies almost over the pelvis of the kidney when this organ is in its normal position.

II. A second group of pains are located anteriorly in the direction of the gall-bladder or at a point on the anterior abdominal wall corresponding in location to the superior lumbar triangle on the posterior wall.

III. From these two points pain may radiate (1) in the direction of the ureter, terminating in the bladder; (2) to the crest of the ileum and the hip and thigh; (3) up to the shoulder

blade; and (4) across the abdomen or back to the opposite side.

IV. By far the greater number of pains of which these patients complain are quite indefinite in their character and location. The patient will say that she has a "pain in her side," placing the whole hand on the flank, or that the pain, starting vaguely in the side, "runs up to the shoulder" or "down the thigh." Again, the pain will be located "in the hip bone" or just below it, suggesting trouble with the vermiform appendix. Other patients will complain simply of an uneasiness in the right or left abdomen or side or dragging sensations in the back, and be quite unable to give any exact location to the pain.

For the differentiation of such indefinite pains the ordinary methods of examination frequently leave us still in doubt. Even when a definite tumor can be palpated its origin is not always possible to determine. We have at our command but few ways of accurately diagnosing pathological conditions from the character of the pain complained of, and yet pain is the one almost constant symptom, the one which most frequently brings the patient to seek medical or surgical relief.

There are many conditions which may give rise to pain of an indefinite character in the abdomen and flanks, especially in the right side, *e.g.* disease of the gall bladder with its many complications; disease of the vermiform appendix; of the Fallopian tube and the ovary; a pneumonia or pleurisy, with abdominal symptoms; a subphrenic abscess; swellings of the liver; abnormal mobility or disease of the kidney; disease or stricture of the ureter. The causes of pain in this region are limited only by the number of anatomical structures to be found here. It has not infrequently happened that grave trouble has been overlooked or wrongly diagnosed simply because, by the means at hand, the surgeon was not able to definitely locate the cause or was not able to differentiate spinal, muscular, renal, or ureteral pain from that caused by disturbance in one or more of the abdominal viscera. Indefinite pain in the back and side is usually referred to one of these causes, *viz.*, the vermiform appendix, the gall bladder, or the kidney, or is classed as "neuralgia."

The many renal and ureteral abnormalities and diseases are with especial difficulty diagnosed and differentiated. Any

rational method which may help us to clear up these pains of obscure origin and to reach a correct diagnosis on which proper treatment can be carried out, will prove of value.

Method of Work.—The method of producing an artificial distention of the pelvis of the kidney in order to reproduce or to rule out certain symptoms which may be referable to disease of this organ, will be described in detail. First, we must be familiar with the patient's history and general condition for several years previous to our present examination. We note especially whether the patient has borne children, whether she has received any injuries to back or abdomen, and whether abdominal, pelvic, or renal operations have been performed. The general condition of the patient is noted, especial attention being paid to the reliability of her answers when questioned about the pain which she has had. A thorough history of any renal, ureteral, or bladder trouble is taken and a careful urinary analysis made. These preliminary examinations having been made, the patient is prepared for a cystoscopic examination. The patient is told that an examination is to be made of the bladder, but is not forewarned that her original pain may be reproduced during the examination.

With the patient in the knee-breast posture, a suitable Kelly cystoscope is introduced into the bladder and the ureter of the side affected is catheterized. A renal catheter should be selected of suitable size to just fill snugly the ureteral orifice, in order that there may be no reflux of fluid around the catheter and back into the bladder. The catheter should have a moderately dull and short point and a large eye. The tip may be coated with wax if a stone is suspected and thus additional evidence be gained. The catheter is inserted slowly and care is taken that the tip does not strike the pelvis of the kidney with force, causing injury to the surface epithelium from which hemorrhage may occur, and pain to the patient. The eye of the catheter should reach the kidney pelvis. As soon as the catheter has been placed, the cystoscope is removed from the bladder and the patient is allowed to assume a comfortable position on her side or back. A small glass catheter is inserted into the bladder to remove the air and is left in position to act as a control should any fluid from the injection escape around the renal catheter and return to the bladder. This fluid would then immediately appear through the glass catheter and we

would know that the fluid injected was not distending the kidney pelvis or ureter but was simply flowing back into the bladder. The patient is now allowed to rest for a few moments and the rate of flow of urine from the catheterized kidney and its character are noted.

The instrument used for injecting the kidney is a simple glass-barreled aspirating syringe of 15 c.c. capacity. This syringe is, in most cases large enough. For the rapid injection of larger amounts in cases where the kidney pelvis is much dilated, we use a compressible rubber bulb with tube and glass connection. This bulb enables one to throw rapidly a large amount of fluid into the kidney, the pressure being regulated by the hand. Attached to the syringe is a two-way stopcock, on one limb of which is screwed a fine, graduated nozzle of such a size that it will fit snugly in the lumen of the renal catheter. To the other limb of the stopcock is attached a piece of rubber tubing, the free end of which is placed in a flask of the solution to be used for injection. This solution may be any bland fluid colored by a few drops of an aqueous solution of methylene blue in order that leakage around the catheter into the bladder may be more easily and quickly detected. By means of the two-way stopcock the syringe may be readily filled and emptied without removing the nozzle from the renal catheter. The plunger of the syringe should be made of asbestos, fitting snugly in the glass barrel, allowing no fluid to pass the plunger, and at the same time the piston must move with the greatest ease throughout the entire length of the barrel in order that during the injection the pressure of the fluid may be readily controlled by the slightest touch of the thumb. The entire syringe and pointed nozzle may be sterilized by boiling.

The syringe is filled with the methylene blue solution heated to body temperature, all air being carefully excluded. The patient is made as comfortable as possible in order that she may be perfectly able to describe the pain about to be produced and to answer any questions as to its location, etc. The nozzle is inserted tightly into the catheter and the fluid is slowly injected. The free end of the renal catheter has been kept sterile by means of a short piece of rubber tubing which covers the end and protects it during the manipulation of the catheter and is removed when necessary.

Fluid is carefully forced into the pelvis of the kidney until the patient *begins* to feel pain. Care must be taken not to cause the patient too much or too sudden pain, for then she will be unable to give the desired information concerning its character and location and the colic produced may persist for 24 hours after the examination. As soon as the pain becomes definite but not severe, the necessary information is quickly obtained from the patient and immediately the syringe is removed and the fluid released, giving instant relief. As the injection proceeds the glass catheter in the bladder is watched to see that no reflux around the renal catheter has taken place. The amount of fluid injected to cause pain is registered on the piston of the syringe and the amount returned through the catheter when the syringe is removed is measured in a conical c.c. measuring glass. The immediate return of fluid from the renal catheter should equal the amount used in the injection.

The cubical contents of the renal pelvis may also be measured with this instrument and the exact amount of distention determined.

Results of Injection.—The injection of the normal pelvis and the character and location of kidney pain.

It has been a help in this work to inject many normal kidneys in order to find out just what kind of pain "renal pain" is, and to find a definite location for such pain and to learn its characteristics. Many normal kidneys have been injected with this end in view. As a result there has come to be recognized what might be called "typical renal pain." Such pain may be produced suddenly or may be brought on slowly according to the rapidity with which fluid is forced into the pelvis of the kidney. On slowly injecting the pelvis the patient complains first of a dull aching pain in the back on the side on which the kidney has been injected and at the level of the pelvis of this kidney. This "spot" the patient accurately locates herself by placing her forefinger directly over the seat of pain. The pain then is not a general one involving a large area, nor is it at all indefinite in the patient's mind as to its location or character. With the normal kidney, this "spot" is located in the angle formed by the quadratus lumborum muscle and the twelfth rib, the "one soft spot in the back," that is the point called by Dr. Kelly the "superior lumbar triangle," and which is mentioned above. Starting at this point, the

pain as it increases shoots first anteriorly until the patient definitely locates it at a point on the abdominal wall corresponding to the level of that in the back. The pain anteriorly is not produced until by continued forced distention of the kidney pelvis the pain becomes more and more acute. On forcing the injection still further, pain radiates in the direction of the ureter and above the iliac crest. At this stage the pain is so acute that the patient is able with difficulty to state its exact location and complains of pain all through the flank, back, and even in the iliac fossa. It has not been possible to cause pain to radiate down the thigh or up to the shoulder. In this manner are reproduced all the symptoms of an acute "renal crisis." Nausea may be present. By becoming familiar with these different stages of renal pain, this knowledge is useful in differentiating such pain from that of other origin, such as the gall-bladder, vermiform appendix, etc.

It is from the patient herself that one obtains a diagnosis. The pain produced is of such a definite character that the patient will say without hesitation whether this is or is not the same pain as that of which she complains when at home. If the pain is the same, then it must be of renal origin and we must investigate carefully the ureter for stone or stricture or test the mobility of the kidney or examine for perinephric abscess or other perinephric disease. If the pain is definitely not the same, then we can rule out the kidney as a cause and search for trouble elsewhere. A study of the following cases will help demonstrate the value of this method.

Classification of Cases.—The 100 cases have been divided into four groups:

I. Normal kidney pain produced. Not that pain of which the patient complained. Disease of the kidney ruled out.

II. Kidney pain reproduced. Same pain as that of which patient complained. Diagnosis of renal or ureteral disease confirmed.

III. Dilated pelvis of kidney. Stricture of ureter.

IV. Doubtful cases and failures.

Group I includes 23 cases. In all of the cases, typical kidney pain was produced by the injection of fluid into the pelvis. This pain had a definite location in the superior lumbar triangle described above. In no case, however, did the pain produced correspond in any particular with the pain of which

the patient had previously complained, and disease of the kidney, due to any cause which might lead to permanent or intermittent dilatation of the kidney pelvis, was ruled out. In seven cases the pain was found to be due to pelvic disease and pelvic and abdominal operations for its relief were performed. In 6 cases the cause of the patients' pain lay in a diseased vermiform appendix. In 6 cases no diagnosis was reached, although disease of the kidney was ruled out, and no operation was performed. In one case the abdomen was opened but nothing to account for the patient's pain was found. In one case where a nodule, felt by pelvic examination, was suspected to be pressing on the ureter, causing trouble, it was demonstrated that this nodule was in no way interfering with the function of the ureter. In one case a differential diagnosis was made between a tumor of the spleen and one of the left kidney. In one case, which was suspected to be hydronephrosis complicating pregnancy and due to pressure of the pregnant uterus on the ureter, it was shown that the kidney was normal.

In 5 cases in this group abdominal operations had previously been performed, 4 of which were for the relief of the symptoms of which the patient now complains.

The confusion which is often present between the pain caused by pelvic disease or disease of the vermiform appendix and that of renal origin is shown by a study of these 23 cases, in all of which pain was present which might easily have been referred to some trouble situated in the kidney or ureter.

GROUP I.

No.	Gyn. No.	Date	Name	Age	Color	Para	Previous Operations. Result	Abd. Ex.	Kid. Inj.	Pos. of Pt.
1	9,666	5-24-'02	A. W.	30	W.	4-para	None.....	K.'s not palp...	R.	L.L.
2	12,600	1-27-'06	K.	23	"	S.	"	R. K., 2d deg...	L.	"
3	9,648	5-17-'02	Z. G...	30	"	1-para	"	R. K., palp.....	R.	"
4	9,271	12-11-'01	M. R.	26	B.	S.	"	K.'s not palp..	L.	"
5	10,150	12-26-'02	E. R.	27	"	M.	{ Exp. lap. for pains.. Susp. of uterus... None.....	} K.'s not palp.	"	"
6	10,485	5-13-'03	M. P.	38	W.	M.				
7	10,469	5- 8-'03	L. C.	26	"	"				

Group II includes 50 cases. In all of these cases typical kidney pain or pain referable to the kidney was reproduced and was at once recognized by the patient as the pain of which she had complained and for the relief of which she had entered the Hospital. In 35 cases, 25 right and 10 left, the kidney was found to be movable and was suspended. In 8 cases, 4 right and 4 left, the kidney was movable but operation was refused. In 2 cases, 1 right and 1 left, treatment by bandage was advised. In 3 cases nephrotomy was performed with relief of symptoms. The uterus was suspended in one case and the appendix removed in one case, neither operation affording any relief of the patient's pain.

This group of cases has proved to be the most satisfactory in regard to localizing indefinite and obscure pain in the back and sides. While several of the patients had had definite renal or Dietl's crises, by far the larger number could give but an indefinite description of the pain and several complained chiefly of an "uneasiness" or "dragging weight" in the side of the abdomen. This vague pain was, however, sufficient to prevent the patient from attending to her daily duties.

The answers given when pain was reproduced were definite in every instance and were given voluntarily, without questioning on the part of the examiner. There existed no doubt in the patient's mind as to whether the pain was the same as that which she had suffered before or not. Case No. 28 was a typical one in this respect.

GROUP I. CONTINUED.

Sol. Used	Amt. Used	Amt. Ret'd	Reflux	Character of pain produced	Location of pain	Diagnosis	Operation	Remarks
Bor. 50%	17	X	o	Typ. kid.	S. L. tr'gle	No renal dis.	R. salp. ooph. appendect. Susp. of ut. R. R. V. O.	Old encapsulated extra-uterine pregnancy of rt. side. Pain seemed to resemble kid. pain.
M.B.	6	8	o	" " "	" "	" "	Dil. of cervix. Stenosis of int. os. ut.	Sympts. of severe dysmenorrhea resembling renal attacks. Pain referred from pelvis.
Bor. 50%	10	10	o	" " $\frac{1}{2}$	" "	" "	Appendect. Susp. of ut. R. R. V. O.	Pain in back, indefinite, on admission.
Bor.	4	4	o	" " "	" "	" "	.....	Tubo-ovarian abscesses; bilateral, sharp attack acute pain lt. flank, resembles renal pain.
"	10	10	o	" " "	" "	" "	Double salp. oophorect.	Pain in stomach and back.
M.B.	..	..	o	" " "	" "	" "	Amp. cervix	Pain left side.
...	...	..	o	" " "	" "	" "	Susp. uterus. R. R. V. O.	Result, improved.

GROUP I.

8	11,005	1-21-'04	M. J.	31	B.	M.	{ D. & C.; Exp. lap norm. find'gs. Susp.	{ K.'s not palp.	R	L.L.
9	8,763	5-16-'01	A. M.	28	W.	S.	ut. 1 yr. ago.....	K.'s not palp...	"	"
10	10,768	10- 2-'03	F. M.	36	"	"	None.....	Tend. ov'r r. k.	"	"
11	10,101	11-22-'02	H. H.	31	"	3-para	"	R. K., 3d deg...	"	"
12	12,518	11-16-'05	H. B.	29	"	"	"	Tend. ov'r l. k.	L.	"
13	10,110	11-25-'02	T. P.	29	"	S.	Append. '00; no r.f.	K.'s not palp...	"	"
14	10,731	9-18-'03	G. B.	24	"	M.	None.	" " " ...	"	"
15	11,308	.....	H. L.	23	"	S.	"	" " " ...	"	"
16	10,128	12- 6-'02	B. S.	28	"	1-para	"	" " " ...	"	"
17	11,016	1-25-'04	M. P.	30	B.	M.	Hys. Sal.-oöph., '02	" " " ...	"	"
18	11,163	4- 7-'04	L. B.	21	W.	Pregn't.	None.....	" " " ...	"	"
19	Sn't'm	11- 5-'03	C. S.	45	"	M.	"	{ Tumor in left hypo'drium.. }	"	"
20	"	12-27-'01	T.	20	"	S.	"	K.'s not palp...	R.	"
21	"	4-20-'99	E. S.	36	W.	M.	"	" " " ...	R.	"
22	"	3-27-'00	W. S.	32	"	"	"	" " " ...	"	"
23	8,754	5-17-'01	S. Q.	28	"	1-para	"	R. K., 1st deg...	"	"

GROUP II.

24	9,273	12-12-'01	M. S.	46	W.	5-para	None.....	{ L. K., 3d deg. R. V. O. }	L.	L.L.
25	11,173	4-10-'04	M. J.	23	"	S.	"	R. K. palp....	R.	"
26	12,496	11- 8-'05	L. L.	33	"	"	{ L. Salp. oöph'y. Susp. uterus, '02 5 op'ns for gen. enteroptosis.... }	" " " ...	"	"
27	12,556	12- 4-'05	S. K.	35	"	"	None.....	Lt. K., "	"	"
28	10,365	3-28-'03	A. W.	40	"	"	"	{ R. K. palp & tender.... }	"	"
29	10,052	11- 3-'02	R. P.	41	"	4-para	Cholecystec'my, '98.	R. K., 3d deg...	"	"
30	8,481	1-29-'01	H. T.	42	"	3 "	None.....	" " " ...	"	"
31	7,892	6-12-'00	S. S.	28	"	4 "	"	L. K., "	L.	"
32	11,069	2-22-'04	R. M.	19	"	1 "	"	R. K., "	R.	"
33	12,224	7- 9-'05	M. C.	30	"	1 "	"	" " " ...	"	"
34	12,002	3-28-'05	M. L.	26	"	1 "	"	" " " ...	"	"
35	11,884	2-12-'05	C. H.	40	"	M.	D. & C. trache'phy..	R. K., 2d deg...	"	"
36	11,346	6-10-'04	L. M.	36	"	5-para	None.....	R. K., 3d deg...	"	"
37	11,223	4-25-'04	B. R.	26	"	1 "	"	" " " ...	"	"
38	11,142	2-29-'04	L. H.	26	"	3 "	"	" " " ...	"	"
39	10,949	12-21-'03	M. L.	24	"	2 "	"	Tender l'ft k....	L.	"
40	10,286	2-25-'03	D. S.	46	"	6 "	"	R. K., 3d deg...	R.	"
41	10,202	1-21-'03	J. R.	30	"	M.	Append. '98; no r.f.	" " " ...	"	"
42	10,100	11-22-'02	D. K.	29	"	pregn't.	None.....	" " " ...	"	"
43	7,820	5-16-'00	M. C.	24	"	S.	"	{ R. K., " L. K., 2d deg. }	L.	"
44	10,410	4-14-'03	N. C.	23	"	"	"	R. K., 3d deg...	R.	"

GROUP II.—CONTINUED.

45	10,045	11- 1-'02	L. S.	28	W	M.	Gallstones, 1901....	R. K., 2d deg...	R	L.L.
46	10,697	9- 3-'03	K. H.	39	W.	M.	None.....	L. K. 3d deg...	L.	"
47	10,784	10- 6-'03	S. B.	36	.....		" .....	K. not felt....	"	"
48	10,744	9-25-'03	M. K.	20	.....		" .....	Negative.....	"	"
49	12,464	10-20-'05	K. O.	..	W.	.....	Explor. lap., neg....	R. K., 2d deg..	R.	"
50	12,786	2-'06	S. T.	25	"	M.	None.....	" " " "	"	"
51	10,977	1- 6-'04	M. J.	24	B.	S.	"	" " " "	"	"
52	Outside..	11-13-'03	H. S.	20	W.	"	"	" " " "	"	"
53	"	.....	L. M.	25	"	"	"	L. K., 2d deg...	L.	"
54	Disp'ry..	11- 3-'05	M. M.	..	"	2 para	"	R. K., 3d deg...	R.	"
55	"	"	P.	28	"	3	" .....	" .....	.....	.....
56	Sanat'm.	10-11-'00	W. W.	30	"	M.	"	L. K., " "	L.	"
57	"	3-17-'99	F.	33	"	"	R. tubal preg., '98.	" " " "	"	"
58	"	3- 2-'01	L. M.	24	"	S.	None.....	" " " "	"	"
59	"	10- 2-'00	R. K.	37	"	"	"	R. K., " "	R.	"
60	"	3- 1-'01	J. S.	35	"	M.	"	" " " "	"	"
61	"	3-26-'03	E. N.	39	"	S.	2 abd. op, no r'l'f	" " " "	"	"
62	"	10-16-'00	R. W.	22	"	"	None	L. K., 2d deg...	L.	"
63	"	4- 4-'03	F. D.	39	"	M.	"	R. K., 1st deg. .	R.	"
64	"	3-28-'01	G.	..	"	"	"	L. K., 3d deg...	L.	"
65	"	12- 3-'03	G. M.	34	"	2 para	R. R. V. O.....	R. K., " "	R.	"
66	"	11-10-'03	A. M.	43	"	M.	None.....	" " " "	"	"
67	"	6-10-'07	C.	30	"	"	"	" 1st deg...	"	"
68	"	10- 6-'03	S. L.	35	"	"	"	L. K., 3d deg...	L.	"
69	"	3- 7-'05	H.	..	"	M.	"	Negative.....	R.	"
70	11,818	1-18-'05	L. L.	34	"	3 para	"	L. K., 3d deg. .	L.	"
71	9,669	5-26-'02	E. M.	51	"	10	"	Negative.....	"	"
72	11,151	3-31-'04	M. K.	27	"	S.	"	"	R.	"
73	11,438	7-30-'04	T. W.	26	"	"	"	L. K., 2d deg. .	L.	"

GROUP III.

74	10,813	10-19-'03	F. S.	21	W.	S.	Nephrolithiasis, '02	R. K. enlarged.	R.	L.L.
75	12,742	3- 5-'06	M. D.	..	"	M.	.....	Palp. tumor. .	"	"
76	11,116	3-14-'04	F. W.	25	"	3	None.....	Negative.....	"	"
77	12,552	12- 8-'05	L. R.	18	"	"	App'tomy; no r'l'f..	"	"	"
78	10,860	11- 9-'03	S. M.	57	"	6 para	None.....	"	L.	"
79	11,001	1-28-'04	F. S.	20	"	S.	Nephrolithotomy...	"	R.	"
80	Sanat'm.	6-25-'00	G. P.	20	"	M.	None.....	"	L.	"
81	"	1-21-'02	W. H.	30	"	"	"	"	R.	"
82	"	6- 7-'04	A.	..	"	preg'nt.	"	"	L.	"

GROUP II.—CONTINUED.

M.B.	...	...	o	Typ. kid.	...	Mov'ble kid.	Nephropexy...	Dull, aching pain in back. Relief.
"	50	50	o	" " "	" "	Nephropt'sis Dil'd pelv.	" ...	Complaint, dull pain left side; followed labor.
M.B.	...	...	o	" " "	" "	Nephropt'sis	Susp. uterus	Complaint, dull pain left side and back.
"	...	...	o	" " "	" "	"	Nephropexy...	Complaint, dull pain left side and back. Relief.
"	5	10	o	" " "	" "	"	" ...	Complaint, dragging pain rt. side; nausea.
"	9	10	o	" " "	" "	"	" ...	Complaint, pain rt. side.
"	...	...	o	" " "	" "	Appendicitis	Appendect'y...	No relief from operation. Symps. all from kid.
Bor.	12	17	o	" " "	" "	Nephropt'sis	Nephropexy...	Complaint, attacks of pain.
M.B.	...	...	o	" " "	" "	"	" ...	Complaint, dull pain 2 yrs.
"	7	10	o	" " "	" "	"	" ...	"
"	9.5	10	o	" " "	Low.....	"	" ...	Complaint, dull pain in back.
Bor.	6	6	o	" " "	S. L. tr'gle	"	" ...	Complaint, attacks of intense pain left kid. region.
"	...	...	o	" " "	"	"	" ...	Previous diag. had been nervousness.
"	...	...	o	" " "	"	"	" ...	Complaint, violent attacks of pain.
"	8	8	o	" " "	"	"	" ...	Complaint, full tumor in side.
"	..5	5	o	" " "	"	"	Rt. ophor'y...	Pt. could differentiate pain in rt. iliac fossa from kidney pain.
"	..3	11	o	" " "	"	"	Bandage.....	Pt. wears bandage with great relief. Had been advised to have both ovaries removed.
"	...	...	o	" " "	"	"	" ...	Complaint, heavy pains in right side.
"	..8	9	o	" " "	"	"	None	Dilated pelvis.
"	32	34	o	" " "	"	"	"	Constant pain right side for 2 yrs. Attacks recently.
"	32	30	o	" " "	"	"	"	Complaint, drag. pain in right flank.
"	...	...	o	" " "	"	"	"	Complaint, attacks left renal region.
"	..7	..10	o	" " "	"	"	"	"
"	6	6	o	" " "	Diffuse...	"	Split renal capsule Appendect'y.	Relief.
M.B.	...	...	o	" " "	S. L. tr'gle	"	Nephrotomy...	Relief.
Bor.	...	...	o	" " "	"	"	"	"
M.B.	...	...	o	" " "	"	"	Susp. uterus no relief.	Complaint, constant dragging pain in back, 2 yrs. Not relieved. by susp. of uterus.
"	...	...	o	" " "	"	"	None	Typical pain reproduced Pt. refused operation.

GROUP III.

M.B.	50	50	o	None.....	.....	Hyd'n ph'sis	Nephrotomy...	Complaint, sharp pain rt. side. Complete relief
"	2	60	o	" ..	.....	"	Freeing of ureter.	"
"	65	80	o	Some	S. L. Tr'gle	St. in ureter.	Nephrectomy.	Complaint, tumor right side. Relief
"	6	8	o	"	" "	Stricture of ureter.	Remov. stone	Complaint, six renal attacks in past 4 years.
"	...	...	o	"	" "	"	None	Complaint, acute attacks, pain right side
"	...	...	o	"	" "	"	Ureteral transplantation.	Pt. passed small stone
"	30	30	o	"	" "	Dilated pelv.	None	Definite renal crises. Complete relief.
Bor.	...	...	o	"	" "	"	"	Complaint. Ur'tal colic
"	30	30	o	"	S. L. tr'gle and rt. fl'k	"	"	Complaint, attacks of pain left side.
"	27	30	o	"	"	"	"	Complaint, constant pain over right hip.
"	...	...	o	"	"	"	"	Pregnancy contraindicated operation.

GROUP III.—CONTINUED.

83	Sanat'm.	11-11-'05	F.	..	W	M.	None.....	Negative.....	R.	L.
84	"	12- 7-'03	S.	..	"	"	"	"	L.	"
85	Outside .	5-17-'00	I. D.	41	"	S.	"	"	R.	"
86	Sanat'm.	3-13-'03	F. S.	36	"	M.	"	"	R.	"
87	"	11-24-'05	Mc B.	..	"	S.	"	"	"	"
88	"	12- 9-'05	C.	31	"	1-para..	"	"	R.L.	"
89	"	5-31-'00	L. H.	22	"	S.	"	General ptosis..	L.	"
90	.....	3-27-'06	K. P.	45	"	5-para..	"	Both K. enl'g'd.	R.L.	"

GROUP IV.

91	10,881	11-17-'03	I. J.	26	"	M.	None.....	K. not palp..	L.	L.L.
92	10,989	1-11-'04	M. M.	39	"	1-para	Abd. abscess, 1895.	" "	R.	"
93	11,914	2-25-'05	M. E.	25	"	S.	{ Suspens.R. R., '03 Append.....'03 L.nephro'tomy, '04 }	" "	L.	"
94	12,665	2- 1-'06	L. S.	30	"	"	Ap'my '02; no rel'f.	Tend.ov'r R. K.	R.	"
95	11,186	4-12-'04	L. B.	34	"	1-para	None.....	L. K., 3d deg..	L.	"
96	Sanat'm.	5- -'00	T. U.	30	"	M.	"	Negative.....	R.	"
97	9,841	-12-'02	M. S.	39	"	7para	{ R. R. V. O '00 Susp. uterus.....'01 No relief..... }	No ptosis....	"	"
98	11,024	1-28-'04	F. N.	35	"	6-para..	None.....	" " " " "	R.	"
99	11,871	2- 8-'05	L. B.	31	"	3 "	"	" " " " "	"	"
100	12,711	2-18-'06	L. Q.	47	B. M.		{ Hyst.-myo- mectomy '05 }	Tumor in R. kid. reg....	"	"

GROUP III.—CONTINUED.

Bor.	16 10	16 8	o o	Some	S. L. tr. rt. fl. Middle of abd'm'n crest of ileum.	Dilated pelv.	None	
"	...	...	o	"	S. L. tr'gle	Dilated p'lv. Ureteral stone.	Remov. stone.	Wax-tipped catheter made diagnosis of ureteral stone.
"	...	...	o	"	" "	Stricture of ureter.	None	Complaint, pain right side of bladder.
"	29	30	o	"	" "	Stricture of ureter.		Stone in ureter, scratch marks two wax tips.
"	R. 80 L. 35	60 35	o o	None . . . .	.....	Dilated pelv.	Fixat'n of both kidneys. Plication of pelves.	Complaint, disappearing tumor right side.
"	14	14	o	Indefinite, but se- vere.	Vague. . . .	" "	Stomach, liver and kidneys susp'd. No relief.	Complaint, pain left side about navel and in back. Dragging in ab- domen.
"	21 30	28 30	o o	Typ. kid..	S. L. tr'gle and al'g ureter.	" "	Susp. of uterus R. R. V. O.	Probable congenital cys- tic kidneys with no symptoms. Pt. had not complained of pain produced.

GROUP IV.

Salt	...	...	.	Some pain	Under left costal margin.	Trigonitis.	None	Complaint, Pains in back and left side. Pain complained of was re- produced, but sympts. not severe enough to operate.
"	...	...	.	" "	Right side		"	Complaint, aching pain right side. Kidney not felt, therefore no op. performed, although typ. pain was repro'd.
M.B.	5	5	o	" "	S. L. tr'gle	Nephralgia Cholecysti- tis	"	Complaint, pains in ab- domen, general. Dil- ated pelvis ruled out but no diagnosis made Pt. has at times the pain reproduced in left kidney.
"	6	8	o	" "	" "		"	Complaint, pain rt. side, nervousness. Pt. has had pain reproduced by injection, but this is not her worst pain.
"	...	...	.	Indefinite.	Vague. . . .	.....	Refused.	Complaint, pain over rt. kidney extending to ureter and bladder. Injection was made only low in ureter, ac- counting for indefinite answers. Symptoms prob. are from lft.kid.
"	14	14	o	Some pain	S. L. tr'gle	Appendicitis and renal pain.	None	Complaint, pain in kid., formed part of pt.'s pain and was assoc'd with appendic'l pain.
"	13	15	o	" "	" "	Omental ad- hesions.	Release of omental adhesions.	Complaint, drag. pains in abdomen. Injec. of right kidney repro'd'd same pain as that caused by drag. omen- tal adhesions on right side.
"	...	...	.	" "	S. L. tr'gle and abd.	Cholelithia- sis.	Cholecystec'y..	Complaint, pain right side for 3 years.
"	...	...	.	" "	S. L. tr'gle	.....	Explor'n over kid. Explor'n laparotomy.	Pt. was sure of same pain repro'd. Opera- tion failed to reveal any trouble.
"	...	...	.	" "	Pain in tu- mor.	Sarcoma of kidney.	No operation..	Autopsy revealed huge sarcoma of liver closely pressing on rt. kidney, which was ap- parently normal. As- sociated pain.

A kidney although movable may be causing no symptoms. This was demonstrated in case No. 43, where the right kidney, although more movable than the left, had caused no pain or discomfort whatever.

Seven patients had previously been operated upon for the same complaints, without relief of symptoms. One patient had been told that the movable kidney was an "ovarian tumor" and had refused operation on this account.

Group III includes 17 cases. In 10 of these cases no operation on the kidneys was performed; pregnancy was a contra-indication in one; in another the disease was bilateral, and in a third the patient passed a stone spontaneously. Seven cases refused operation. Of the remaining 7 cases, the kidneys were suspended and the renal pelvis folded in one; the stomach, liver, and kidneys were suspended in another; stone was removed from the ureter in 2; the ureter was retransplanted into the bladder in one; stricture of the ureter was freed in one; and the kidney was removed in one case.

These cases are important chiefly from the fact that a diagnosis of the exact amount of distention of the renal pelvis was made. Thirteen of these patients had complained of pain and this pain was reproduced by injection.

Case No. 75 proved to be a huge hydronephrosis. 260 c.c. of fluid were injected without pain, but accompanied by enlargement of tumor. None of this fluid was returned, as distention of the pelvis produced a flap-like valve shutting off the ureteral orifice. The diagnosis was positive.

Group IV includes 10 cases. These cases indicate the limitations of this method of diagnosis. In 6 cases the answers of the patients were so indefinite or the location of the pain produced was so vague that a positive diagnosis could not be made. In 3 cases, the same pain was reproduced and its location was fairly definite, and yet in one, omental adhesions were found, in another gallstones, and in the third no disease of the kidney was detected. These three cases are regarded as failures. Three of the patients had had previous operations for the relief of pain but without beneficial result. In one case, No. 100, there was present a large notched tumor of the right flank, supposed to be sarcoma of the kidney. Injection caused pain in this tumor. At autopsy the tumor was found to be of hepatic origin but closely associated with the right kidney. Pain was easily referred to the tumor by the patient.

Conclusions.—I. The ability to reproduce, mechanically or otherwise, the pain of which a patient complains is always a most valuable aid in diagnosis.

II. A definite and typical "kidney pain" (renal colic) can be produced in every instance by forcibly distending the pelvis of the kidney with a bland fluid.

III. In a large majority of cases (98 per cent. in our series), patients are able to accurately differentiate renal pain caused by the method described above, from pains from other causes.

IV. By this method a diagnosis can frequently be made in a class of cases, as yet undifferentiated by the medical profession, whose symptoms are vague and indefinite.

V. Accurate measurements of the amount of dilatation of the pelvis of the kidney may be made with the instrument used, and by this means valuable data are obtained.

SOME COMMON VARIETIES OF OBSTRUCTED LABOR, WITH CLINICAL ILLUSTRATIONS.*

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OBSTRUCTED labor, broadly stated, is that condition of parturition which results from any interference with its orderly progress, through lack of harmonious action between its three factors, the powers, the passage, and the passenger. The term is evidently relative only, since its degree depends upon the completeness with which such delivery is inhibited. The character of the obstruction in one patient may cause merely delay in an otherwise natural event; in another patient it may be deterrent enough to prevent even engagement. Under such a definition any labor which varies in essentials from a normal course may be said to be obstructed, and the definition will include not only minor forms of dystocia, like simple uterine inertia, but also the graver varieties due to placenta prævia, massive child, extreme pelvic deformity, new growths, etc.

In most cases of obstructed labor the three factors contribute more or less equally to make the obstruction. To illustrate

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by a common example: a primipara with undeveloped musculature, both general and local, carries to maturity a comparatively large child. In such an instance all the factors, —powers, passage, and passenger—are unitedly at fault. In a smaller proportion of cases only a single factor is deficient; the chief obstacle may be simply a lazy uterus, a contracted birth canal, or an irregular position of a normal presentation.

Upon the exactness with which the particular form of obstruction is diagnosed will depend largely its successful management. The general rule, therefore, should control, that delay in the first stage warrants a thorough intrauterine examination; *intrauterine*, because no other method of examination is reliable for detection of abnormal conditions, whether maternal or fetal. External pelvimetry, however valuable *per se*, is only corroborative of internal pelvimetry, nor are abdominal palpation and auscultation more than suggestive. Such conditions as placenta prævia, cervical or corporeal fibroids, premature ossification of the fetal head, hydrocephalus, teratomata and unilateral deflection of the pelvis, any or all of these, are particular causes of dystocia which are to be recognized only by direct exploration of the vagina and uterus. In any case, therefore, of obstructed labor, the facts gained from early intrauterine examination warrant that method of diagnosis.

The forms of obstructed labor more often met in general obstetrical practice are simple inertia uteri, rigidity of the cervix (pathological or anatomical), overdevelopment of the child (from heredity, prolonged gestation, or disease), posterior position of the occiput, and simple flat pelvis. The present paper is restricted to the consideration of these especial varieties, which are illustrated by clinical examples from the author's notebook.

I. Simple inertia uteri, or "lazy uterus."

A stout young American, of phlegmatic temperament and good social position, was first visited at the commencement of labor, which was at term. Examination then showed a large child in the first (O. L. A.) position, with a small amount of liquor amnii. Contractions were feeble, recurring not oftener than once in fifteen or twenty minutes. After fifty-six hours of pains of this character the cervix had dilated only about two-thirds, though stimulated by several hot douches, digital stretching, and two doses of ten grains each of quinine. As the delay was due apparently to simple laziness of the uterus and the patient was getting very tired, Simpson's forceps was applied

under full anesthesia. After a long, hard traction a living male was delivered, weighing ten pounds. Extraction of the placenta was followed by profuse flooding despite vigorous uterine massage, intrauterine irrigation with hot water and vinegar, and hypodermics of ergot and strychnine. It seemed almost impossible to arouse the flabby uterus, but when the woman was *in extremis* life was saved by enemata of hot salt solution to the amount of several quarts. The puerperium was uneventful otherwise than being retarded by acute anemia, but the child died on the sixth day from melena, blood passing freely from the mouth and anus. The first stage was obstructed by simple weakness of contractile force, for the passage was competent though the child was large, since a second child, weighing more than eight pounds, was born spontaneously and easily after only six hours of labor. The patient's explanation for the delay in the first confinement was that she was afraid of the obstetrician.

Tardy dilatation, or torpor, of the os and true stenosis are obviously two quite different conditions. Both are largely restricted, clinically, to primiparæ, and are unusual after the mouth of the uterus has been once fully stretched by the passage through it of a full-term child. In multiparæ they may result from the cicatrix, due to a former delivery or gynecological operation, or to disease acquired in the interim of pregnancy. The first of these two conditions is the more common, manifesting itself as a perversion of function rather than as an arrest of it; the second, while being exceptional, is anatomical only.

Inflexibility of the parturient cervix is found in the labors of two types of patients; the plethoric, muscular woman, in whom the sphincteric muscles of the outlet oppose equal resistance to the pull of the longitudinal muscles of the contractile portion, and the delicate, hot-house girl, in whom neither local nor general muscular energy is to be looked for. As would be expected in two such contrasted conditions, the working force of the uterus varies widely. In the first variety labor is strenuous; the woman wears out both herself and her attendants in apparently effective work, and yet no definite progress is being made in dilatation; in the second variety, pains are infrequent, and useless when present.

A protracted first stage of labor, when due to tardy relaxation of the cervix, is quite likely to be found in those young women who have a menstrual history of dysmenorrhea, associated with the limpid, watery form of leucorrhœa, indicative of endotrachelitis. Whether this dysmenorrhea is due to congenital anomalies of structure or to acquired causes, which we vaguely call functional, is immaterial to the present purpose. But the facts that dysmenorrhea sometimes disappears after pregnancy, and that the so-called "rigid os" is more generally noticed in first deliveries only, may bear out the above state

ment. *En passant*, it is noticeable that the early vomiting of pregnancy is more likely to be found in those women who have been subject to dysmenorrhea than in those in whom menstruation is painless.

It has seemed to the author, that this form of obstructed labor is more frequent in first than later deliveries, and is due to emotional rather than organic causes. The dynamic power of the uterus in those multiparæ in whom pregnancy has not occurred too often nor too rapidly, has been developed by the stimulus of the marriage relation, by the athletic training of housework, and by a life in which the social and intellectual interests are necessarily second to the maternal. Another somewhat frequent cause for simple inertia is fear of the obstetrician, explained by ignorance as to the character of his duties, by the natural shrinking from exposure of the person, or personal antipathy to the particular accoucheur. These and other purely mental states may, and often do, obstruct labor. Active labor in one of the author's cases stopped at once after his coming into the lying-in room, owing to the disappointment of the woman in not being attended by her family physician; in a second case labor stopped and did not recommence until a month afterwards, for a similar reason.

The diagnostic symptoms of simple inertia are feeble, infrequent contractions, with slow engagement and dilatation. Bodily suffering is therefore slight, and labor drags along from hour to hour with little or no progress. A vicious circle soon forms, of local and general muscular exhaustion and mental excitation, the patient wearing out herself and the physician with incessant cries for relief and complaints at his seeming indifference to her sufferings. The picture is a familiar one to every family physician.

For the strong, energetic patient, the general line of treatment should be depressant rather than stimulant. An emetic will often do surprising good. Very hot douches of normal salt solution, or of 1 per cent. lysol, repeated every two or three hours, or the time-honored enema of a dram of bromide of potash and thirty grains of chloral, are favorites of many practitioners. Best of all is a full dose of morphine, a quarter or half a grain, with one one hundred and fiftieth of a grain of atropine, administered by hypodermic injection. The result is often quite rapid, full dilatation usually being present in two or three hours, so that it is well to remember that, once given such a hypodermic, the woman should not be left by the obstetrician except for a short time, or upon his return he may

find the child has been born in his absence. Reports are increasing in number of the value of cocaine when used for spastic rigidity of the parturient cervix, applied upon a tampon saturated with a 20 to 40 per cent. watery solution and placed against the os. There seems to be no general absorption of the drug, even when used in these massive doses, and the effect is reported as marvelous when contrasted with other routine management. Inunction of the os with atropine or belladonna seems a crude practice in these more scientific days, and such ointments, as ordinarily dispensed, are certainly open to the objection of being nonsterile.

For the lethargic, anemic woman, of that kind who considers that maternity is always a misfortune, but never a blessing, "rigid os" is a synonym for uterine apathy. Here the management should begin with temporizing, and be changed when suitable for more radical measures. Mental stimulus is generally more indicated than bodily stimulus. All distracting, well-meant interference of friends should be forbidden; conservation of the mind as well as of the body is imperative. Encourage the patient to get out of bed and move about at intervals, and feed her with easily-digested luncheons. In this variety of patients hypodermics of one-thirtieth grain of strychnine, repeated every three or four hours, are advised, and one dose of ten grains of quinine is undoubtedly beneficial. The coaltar derivatives, phenacetin and antipyrin, may be used if well guarded with caffeine. These cases require almost as much patience in the obstetrician as the patient, and their conduct has made or marred the future of many a young physician.

A prerequisite in the management of these trying cases is for the obstetrician to be firm with the hysterical woman, striving in every way to maintain her confidence in his ability to do the work for which he has been called. Professionally his attitude should be that of masterly inactivity, for these are just the labors in which meddlesome midwifery is bad. Ergot is contraindicated, because its strangling clutch upon the child is a greater evil than the lesser one of muscular weakness. Judicious operative interference should wait upon the progress of dilatation, which, when complete, may or may not be succeeded by spontaneous delivery. Inertia of the first stage may complicate the third stage also, and should be forestalled by external uterine massage, which ought to be commenced as soon as the child's head is born. Delivery of the placenta should not be hastened unless decided hemorrhage accompanies extraction of the child's body, when it ought to be removed at once. Richardson's direction in regard to de-

livery of the placenta is a good one, which is to wait for three good contractions before attempting its extraction. Latterly in all these cases the author gives a hot salt intrauterine douche on completion of the third stage, to further contractions and prevent infection.

II. Rigidity of the cervix.

A young, healthy Jewess, quite stout and a primipara, in whom menstruation has always been painful, called the author for labor ending a normal gestation. During the first thirty-six hours the character of the pains in respect to frequency and severity was similar to that of the ordinary first confinement, but for the next twelve hours they grew more and more feeble and finally stopped. For the next two weeks there was no uterine action, then labor began again, but at the end of thirty-six hours of strong pains the cervix was still practically closed. She was then fully anesthetised and the cervix dilated by the Edgar method. At the end of the first stage the presentation was cephalic, in the third (O. D. P.) position, and well down into the pelvis. The head was then turned forward into the second (O.D.A.) position by Simpson's forceps, and after long hard traction a living male, weighing nine and three-quarter pounds, was delivered, with only a slight tear of the vaginal mucosa. Eighteen months afterwards another large child was born spontaneously after about thirty hours of pains, the first stage lasting more than twenty-four hours. The father, who is a physician, and the author, attributed the delay in the first stage of both labors to a rigid cervix.

The author attended a Nova Scotia woman in her first confinement, who was 29 years old, of slender figure and nervous temperament, and with a history of life-long severe dysmenorrhea. For forty-eight hours pains were severe, but at the end of this time the cervix was only partially dilated. During her waking hours hot saline douches were given every four hours, and a full hypodermic of morphine at bedtime. The head was well engaged in the first position. After two days of suffering, when the patient was getting very tired and it was evident that the natural powers were inefficient, the cervix was fully dilated with Simpson's forceps. There was very little moulding of the head because of its unusual firmness, but after long, hard traction a deeply asphyxiated female, weighing nine and three-quarter pounds, was delivered, with an almost complete rupture of the perineum. Both the author and his assistant were thoroughly exhausted after the two hours' work required to deliver. The perineum was sutured at once, and the wound healed perfectly. The child was saved after nearly an hour of careful attention, but right facial and left brachial (Duchenne's) paralysis were present the morning after birth, both happily disappearing after a few weeks. Eighteen months afterwards

a second child, weighing eleven and one-half pounds, was delivered with Tarnier's forceps at the end of eight hours' labor. Extraction at this time was much easier than for the first child, partly explained by the advantages presented by the forceps and partly because the canal had been so fully dilated by the former child, despite the fact that the second child weighed two pounds more than the first.

The author performed a trachelorrhaphy upon a young American for bilateral laceration of the cervix and a secondary perineorrhaphy for rupture extending to the edge of the anus. She became pregnant six months afterwards. Nausea and vomiting began early and defied all medication, but at last disappeared after full dilatation of the cervix with a Palmer bivalve dilator. The remainder of the gestation was normal. Labor began at term with a first position of the head, and five hours after the cervix was fully opened. There being no progress during the next two hours, Simpson's forceps was applied, and a ten-and-one-half pound child easily extracted with the use of only one hand on the instrument. Thirty minutes after delivery the placenta, showing no indication of natural expulsion, was manually detached and withdrawn, badly torn though apparently entire. Judging from later events it was an oversight not to have examined the cervix after delivery for a possible new laceration, but as the perineum had again separated through about one-third of its length, examination of the cervix was forgotten in repairing the perineum. For the next two days there was quite free bleeding from the vagina, the source being probably a tear in the left side of the cervix, as examination three months after delivery revealed a deep separation in that region. Lactation was established on the third day and went on thereafter normally. On the sixth day of the puerperium the patient had severe headache, a chill, and an evening temperature of 102° , which dropped one degree after a vaginal douche. The next morning a piece of fresh placenta appeared in the lochia. Uterine irrigation was repeated twice daily during the next forty-eight hours, the axillary temperature meantime varying from 101° to 102° , but fever then disappeared and the remainder of the lying-in was uneventful.

These three cases may serve to illustrate that form of obstruction due to rigidity of the cervix, the two first being caused by endocervicitis and the last by the cicatrix of a trachelorrhaphy.

The causes of cervical rigidity are classified as functional, organic, and constitutional or anatomical, each of which may include the others and be a reason for obstructed labor. Whether the uterine sphincter is stubborn from reflex action, from spasm of the circular muscle, from continuance of an infantile char-

acter of the organ, from atresia due to disease or a surgical operation, from malposition of the presenting part, or from lack of suppleness as found in "aged primiparæ," any or all of these conditions are veritable hindrances to birth. The important item in the diagnosis is to distinguish between those cases which are simply tardy in dilating, and those which are due to true organic stricture. Spasm as a cause of slow dilatation is said to be indicated by the absence of tension in the membranes, and of the natural mucus of the cervix, by its tenderness and heat, and when it has a hard, thin, unyielding edge. According to Tarnier in constitutional rigidity the os is thick, firm, and insensitive.

The treatment of this variety of obstruction is either medical or surgical, expectant or radical. In spastic rigidity the most reliable agents are vaginal irrigation with hot normal salt solution, given in the knee-chest position, tamponade of the cervix with 20 per cent. to 40 per cent. solution of cocaine, hypodermics of morphine, and enemata of bromide of potash and chloral. In structural stenosis the cervix may be opened by the Dührssen method of incision (which is practically a vaginal Cesarean section,) or divulsed by some variety of the Bossi dilator, or the dilatation may be commenced with a Palmer or Goodell bivalve dilator, or some form of water colpeurynter like the Barnes, Champetier de Ribes or its recent improvement, the Voorhees, and completed with the hand. In private practice the more common methods are packing the vagina and cervix with gauze (Krause method), use of water bags, and either the Edgar or Harris mode of dilatation. But for the ordinary physician the advantages of mechanical dilators over the hand are minimized by certain evident facts: the instruments are expensive and all forms of rubber colpeurynters soon lose their elasticity; the mechanics of these dilators are faulty in that they stretch the canal unequally, that is, the cervical canal is stretched most at its extremities rather than equally from top to bottom, and in the hands of the inexperienced, metallic dilators do more tearing than stretching. All things considered, the best wedge for opening the stubborn uterine outlet is the finger and hand; either or both are always ready when needed, the degree of dilatation is always under intelligent control, and therefore there is less chance of tearing the sphincter than when a metallic instrument is used. The

chief criticism which can be made of the manual method of dilatation is that while using it there is a risk of carrying infection from the anal region into the introitus. Careful observance of the ordinary surgical technic and covering the anus with sterilized towels are of course as essential in this as in every other obstetrical operation. Either of the well-known methods of manual dilatation, the Edgar or the Harris, may be preceded by stretching with the Palmer or Goodell bivalve dilator, until the canal will admit the index finger. In private practice these methods are reliable and sufficient for the purpose, though either requires patience on the part of the operator and full dilatation is not to be expected in less than from three-quarters of an hour to an hour, while the tonic squeeze of the sphincter upon the hand is usually quite painful. One particular part of the method is attended with danger; it is when the knuckles of the hand are just about to pass through the external os or when, after the knuckles have passed into the canal, the hand is shut into the fist. This is the time at which tearing is most likely, so that progress should be careful and slow. Finally the forceps may be used simply as a dilator, and fitted upon the head as soon as the cervix has opened sufficiently to admit the instrument. The forceps both serves as a dilator and stimulates contractions by pulling the head down upon the circular fibers of the cervix.

III. Over-development of the child.

A young, healthy primipara expected labor in the first week of April but it did not begin until the 31st of May. The presentation was an occipito-posterior cephalic. When pains had lasted for twenty-four hours without any descent, after long hard traction with forceps a stillborn female, weighing eight pounds, was extracted. The child's head was firmly ossified, the sutures were closed with bony union, the posterior fontanelle was undistinguishable and the anterior was a mere depression. In other anatomical details the child resembled one several weeks old. The cause of the obstruction was over-development during protracted gestation.

Obstetric science has little to offer in explanation of these anomalies of fetal growth. Why, in a particular instance, gestation is prolonged beyond the usual period is as yet unsettled. Nor does obstetrical art help us much in the management of these deliveries. Some obstetricians of national repute advise that when pregnancy has advanced beyond the classical period of two hundred and eighty days, beginning to count from the

first day of the last menstruation, labor should be induced. So much uncertainty must always exist as to the exact hour of conception—whether in fact it did not begin just before the second absent menstruation—that such a dictum must be received with considerable reservation. If, however, fetal overgrowth has occurred twice consecutively in the same woman, the author believes it is good practice to stop the third pregnancy at classical term.

The problems arising in delivery of massive children are among the most difficult that harass the obstetrician. Extensive laceration of the birth canal is almost inevitable, with considerable maternal mortality from shock, hemorrhage, and infection. Brain injury from forceps pressure, fractures of arms or legs, and death itself are common incidents in the fetal history.

Whether the size of the fetus can be regulated by the diet of the mother is still a moot question. Certain German obstetricians have "modified the diet of a pregnant woman in such a way as to produce definite effects upon both mother and child, and by altering the diet in pregnancy find that it is possible to influence the character of the confinement, of the puerperium, and of lactation, as well as the state of development of the fetus." As to the effect upon the latter, Prochownik shows, by a series of forty-eight cases representing sixty-two confinements, that "maternal diet can so influence the size, weight, and osseous development as to make it possible for the child to be born normally at full term, whereas in previous confinements instrumental means or the induction of premature labor were necessary." (Fifteen observers.) Ballantyne objects to this theory, saying that "it is a question whether it is possible to slacken nutrition in the fetus without delaying development, and it is still undetermined what part the placenta bears to the problem of feto-maternal metabolism." He believes that "the main question is still under experiment, without as yet data for proper scientific conclusions." (Ballantyne, *Antenatal Pathology and Hygiene*.)

Prochownik advises the following regimen; breakfast, small cup of coffee, 26 grams of biscuit or bread with some butter. Dinner, any kind of meat, an egg, fish with a little sauce, green vegetables prepared in fat, salad and cheese. Supper, same as for dinner, with 40 to 50 grams of bread and butter at pleasure.

Water, soups, potatoes, puddings, sugar, and beer are quite forbidden, but from 300 to 400 c.c. of red wine or Moselle is to be drunk. Slight alterations to suit individual tastes are allowable, and the quantity of fluid is not to exceed 500 c.c.

IV. Posterior positions of the occiput.

A middle-aged Swede, of large frame, stout figure, and a multipara, was attended in consultation. Labor had been active for twenty-four hours when the physician attempted to deliver with forceps but completely failed to do so. The patient being fully etherized, the author passed his hand into the uterus where he found a cephalic presentation in the fourth (O. L. P.) position. The occiput was immediately rotated into the first position, after which a living female, weighing eleven pounds, was easily extracted with Simpson's forceps.

The case illustrates the wisdom of an intrauterine examination in finding out an obstruction, and contrasts an impossible delivery with an easy one. In passing, it may be said that in the author's experience this position is quite exceptional, and in such positions the forceps has always failed to extract until rotation forward had been made.

A small, healthy American primipara was at term. Repeated abdominal examination and auscultation during the first stage showed a cephalic presentation with dorsum to the right, and digital examination confirmed the position to be the third, with the head well down in the pelvis. After five hours of labor forceps was applied, within which the occiput turned forward during traction. A threatened rupture of the perineum was prevented by an episiotomy, after which a six and three-quarter-pound male was easily delivered with short forceps.

The case illustrates one of the favorable terminations of an original malposition by spontaneous rotation.

A nervous young American, of medium figure, was found to have a cephalic presentation in the third position. At the end of thirty-six hours of active first stage the head became impacted in the same position, though several attempts had been made manually to turn the occiput forward. Forceps also failed to change the position, and finally a ten-pound living female was extracted with the occiput posterior, the perineum giving way to the verge of the anus.

The case illustrates a common experience in delivery of a malposition.

Early recognition of the malposition settles the question of its management. Should the obstetrician be called, fortunately, at the first of the labor, and palpation of the uterine ovoid show that the fetal dorsum is to the right of the median line with the

focus of auscultation low down in the right uterine quadrant, it is probable that the presentation is cephalic and in the posterior position. This external method of diagnosis is fairly certain up to the end of the third stage, or so long as the head has not descended into the cavity. If the latter event has occurred, external examination itself is not conclusive, but must be corroborated by vaginal examination, because after the head reaches the floor of the pelvis it may rotate forward without a corresponding motion of the trunk, that is, the head may be in the second position while the trunk is still in the original third position.

With a posterior position in the first stage the plan of delivery rests upon one of two methods: first, temporizing until the head has descended to the pelvic floor, meantime encouraging flexion by pulling down the occiput and pushing up the sinciput (a manipulation which is usually ineffective); and second, as soon as the cervix will admit the hand and while the membranes are still unbroken, passing the right hand into the uterus, rupturing the membranes, grasping the child by its face and turning it towards the sacrum. At the same time, with the left hand external in the right groin of the woman, lift out of the pelvis the lower shoulder of the child, and push the trunk over to the mother's left side. The entire child has now been rotated on its vertical axis from the right half to the left half of the abdomen; that is, from the third to the second cephalic position. The important part of the manipulation is to effect rotation of the trunk at the same time as that of the head, otherwise if the head alone is rotated the trunk will pull it back into the original malposition. Ordinarily this little operation is not difficult with the woman anesthetized and the uterus just emptied of the liquor amnii. It is a favorite method of the author, and has been described thus fully because many practitioners are unfamiliar with it. In the opinion of the author the second of these methods is far preferable, in that it anticipates a possible failure of spontaneous rotation and is much the easier way out of the difficulty. Should attendance be delayed until the head has become impacted in the cavity, manual rotation is usually impossible. Theoretically, spontaneous rotation may happen, and practically does occur even with impaction, but quite frequently the only recourse is the forceps and extraction in the original malposition.

The wished-for event in these posterior positions is forward rotation, either spontaneous or artificial, and depends upon three possibilities: 1, artificial correction before engagement, 2, spontaneous correction during descent, and 3, artificial correction during extraction. Forward rotation by any of these plans failing, clinical experience shows that birth in the original malposition largely increases the risks to the child's life and of rupture of the pelvic outlet.

Malpositions of this variety group themselves into one of two classes, easy and difficult, whose treatment may be summarized as follows: 1. Easy cases. Here there is little interference with normal mechanism, particularly forward rotation, and though delivery is more protracted than in normal positions, otherwise there is no decided difference. The head engages well flexed, descends to the pelvic floor, turns forward, and the rest of the delivery is uneventful. In this class of cases the powers are ample, the passage is competent, and the passenger small. 2. In the difficult cases the factors are not in harmony; efficient power is lacking, and there is disproportion between the passage and the passenger. Under these conditions the methods of delivery depend largely upon the period of labor in which the obstetrician first sees the patient. If it is during the first stage, before or just after engagement, he has the choice of the following plans of management: 1, spontaneous forward rotation through posture (lying upon the left side, or in the knee-chest position); 2, with good flexion, temporizing; 3, combined internal and external manual rotation forward; 4, podalic version; 5, temporizing until the head touches the pelvic floor, then low forceps; 6, axis traction forceps at the brim. When the head is impacted in the cavity: 1, assisting flexion and making traction with the finger, vectis, or one blade of the forceps; 2, forward rotation with forceps while extracting; 3, reversed forceps (the Brodhead method); 4, forceps alone; 5, very exceptionally craniotomy, symphyseotomy, or Cesarean section.

V. Simple flat pelvis.

A young, healthy American, of medium figure, was found at term to have a cephalic presentation in the third (O. D. P.) position. After a first stage of twenty-four hours the head was manually rotated forward into the second (O. D. A.) position, forceps applied, and an eight-pound female extracted with difficulty. Vaginal examination showed a projecting promon-

tory, and the pelvis measured as follows; anterior-superior spines, $9\frac{7}{8}$ inches, 25 cm.; crests, 11 inches, 28 cm.; external conjugate, 7 inches, 18 cm., the last diameter being contracted one inch, 2.5 cm. From the external conjugate the true conjugate was estimated to be $3\frac{1}{2}$ inches, 9 cm., a narrowing of one inch, 2.5 cm. The diameters of the fetal head were: occipito-frontal, $4\frac{1}{2}$ inches, 12 cm.; occipito-mental $5\frac{1}{2}$ inches, 14 cm.; biparietal, $3\frac{1}{2}$ inches, 9 cm., all of these diameters being slightly increased. Second child at term; cephalic presentation, first position. A nine-pound male was born naturally and easily after four hours of labor. Third child at term; cephalic presentation, third position. After a twelve-hour first stage the head was manually rotated forward, drawn through the brim with forceps which was then removed, and birth of a nine-pound male was then spontaneous. The cause of the obstruction is a projecting promontory against which the head of the child impinges, and by which engagement is prevented. Progress below the brim is favored by slight enlargement of the rest of the bony canal.

Mrs. H. is a small Irish woman, of medium figure, a healthy, hard-working mother, in well-to-do circumstances. The clinical history of the first two labors was learned from herself. The first child was stillborn after a difficult forceps extraction. During her second pregnancy, acting upon the notion prevalent among these people that childbirth, under conditions like her own, is easier in the old country, she went to Ireland. There she was delivered of a living female, which is now about fifteen years old and has always been somewhat mentally defective. The author assisted in delivering the aftercoming head of the third child, the body of which had been extracted by podalic version. It was a stillborn male and weighed ten pounds. The fourth child presented by the vertex in the third position. Delivery by forceps failed after long traction, owing to slipping of the blades. Podalic version was then performed and the aftercoming head extracted by forceps. The child was again stillborn, weighing like the others, ten pounds, and a male. Either premature delivery, symphyseotomy, or Cesarean section was refused for the fifth child. After six hours of labor at term the head was well engaged in the first position. The child was then quite easily delivered by Simpson's forceps; it was a ten-pound male and alive at birth, but there was a deep pressure mark over the right eyebrow, and it died within a few hours. This woman's pelvis measures as follows: crests, $10\frac{1}{2}$ inches, 26 cm.; spines, $9\frac{1}{2}$ inches, 24 cm.; external conjugate, 7 inches, 17 cm., diagonal conjugate, $3\frac{1}{2}$ inches, 9 cm., the true conjugate being estimated at 3 inches, 7 cm.

Simple flat pelvis is the most common of pelvic deformities, and is usually without external indication, the pelvic external contour being little or no index of the interior. The characteristics

of this deformity are that the brim is flattened from before backwards by projection into it of the sacrum, the latter being relatively smaller than normal, and widened from side to side. It is simply an antero-posterior narrowing, but the true conjugate diameter is seldom less than three inches. The external diameters, spines, and crests, together with the internal transverse and obliques are normal or slightly lengthened, the external circumference of the pelvis being normal or slightly diminished. The best time for measuring the true conjugate in a flat pelvis is just after delivery, when the birth canal is relaxed and the patient probably etherized.

This deformity is probably congenital and hereditary, and is often found in sisters. One of its more evident causes is the habit of carrying weighty articles, such as pails of water, younger children, etc., during the formative age of childhood, which brings a greater strain upon the flexible pelvis than it can support without bending. Clinical experience demonstrates that the old idea, which restricts this deformity to our foreign-born women, is incorrect, since modern methods of pelvimetry show that it is quite frequent among native Americans also. Williams, of Johns Hopkins, finds seven per cent. of deformed pelvis in white women of our cities, and that this condition is nearly three times more prevalent in black than white women. The Boston Lying-in Hospital reports pelvic deformity in two per cent. of native born and six per cent. of foreign born puerpera. Distortion great enough to seriously obstruct labor is probably rare in American private midwifery, but it exists to some extent, according to competent observers, in from ten to fifteen per cent. of all child-bearing women.

Simple flat pelvis is often associated with compound presentations, the more common of which is prolapse of the cord beside the head through one of the bays at the side of the sacrum, sometimes it is a hand that offers with the head, or a foot, rarely a hand and foot together. The projecting promontory interferes with normal engagement; blocking up the inlet against the descent of the head, is a cause for latero-flexions of the head in anterior positions, and turns the occiput backward. The corollary of these facts is, that when a posterior position is discovered during the first stage, or some one of the compound presentations mentioned, it is more than likely that there is obstruction at the inlet.

Methods of delivery in flat pelvis.

The plan for delivery depends largely upon the amount of disproportion between the passage and the passenger, the smaller the child the better its chances of passing safely by the obstruction. In moderate degrees of narrowing, above $3\frac{1}{2}$ inches, and with a child of average size, seven or seven and one-half pounds, two methods of extraction are indicated. 1. If the child is viable, living, and the head engaged, select forceps, preferably the Tarnier or the ordinary model with the traction rods. 2. Select podalic version if the child is floating above the inlet, whether living or dead. In all these forms of dystocia prognosis is grave for the child, the risks to the mother being those peculiar to any difficult delivery. These rules are not inflexible, because some operators are more expert with forceps than version, but as a general rule the forceps is contraindicated when the head is floating above the brim.

Considering the success of modern Cesarean section, the advisability of widening the relative indications for that operation is becoming acknowledged by authorities. Rather than to subject a woman with an obstructed pelvis, particularly a multipara, to the chances of a hazardous delivery by forceps or version, it is thought better to do a section, which is technically easier for the operator, and certainly is less dangerous to the mother and child. Under forceps or version the child is almost invariably lost or is seriously injured, while by section its life can practically be guaranteed. The experience of the author with a woman having a flat pelvis, whom he had delivered of two dead children by forceps and version and saved the third, weighing ten pounds, by section, is decidedly in favor of the section.

Another general guide in selecting the method of extraction in these deformities is the following: forceps is more desirable than version in primiparæ, because in first labors the birth canal is virginal and therefore more resistant than in multiparæ, in whom it has been well stretched by the former passage of a child. In multiparæ version on the contrary is safer than forceps, because the base of the fetal skull is smaller than the vertex, and once it has passed by the obstruction the rest of the delivery is not attended with special danger.

A further reason why the general practitioner should select version rather than forceps in these cases of multiparæ may be

presented: 1. It is difficult, if not impossible, to grasp the head, when floating above the brim, with the model of forceps ordinarily used. If the blades are applied in the customary manner along the sides of the pelvis the head is seized in the oblique, occipito-frontal diameter, which is too long to be accommodated in the narrowed brim. Under the pressure now necessary for extraction the skull must be moulded for passage past the promontory by changes in three of its diameters; that is, shortening of the occipito-frontal diameter, lengthening of the biparietal diameter, and compensatory increase in the vertical diameter. These changes are very liable to injure the fragile brain, causing intracranial hemorrhage and asphyxiation. If the ordinary forceps is applied across the biparietal diameter, the so-called "anteroposterior application," the mechanics of its traction is incorrect, since as the line of draft cannot be in the axis of the superior straight, power is wasted in drawing the head against the symphysis. If, therefore, the forceps must be used with the head unengaged, it should always be the Tarnier or some of its imitators, which instrument the general practitioner does not have.

2. As has been suggested above, podalic version is indicated rather than forceps when the head is free above the brim and for multiparæ, because as the base of the skull is smaller than the vertex the former will pass an obstruction more readily than the latter, since the vertex will mould more easily when aftercoming than when presenting. And again, it is to be remembered that in simple flat pelvis the obstruction is at the brim rather than in the canal as a whole, and with this overcome the rest of the delivery is not usually difficult because below the inlet the canal is ordinarily competent. In primiparæ the Walcher position, in which the woman is placed with the nates overhanging the edge of the operating table with the feet resting upon a support, should be of service, because now the anteroposterior diameter of the pelvis is lengthened about one-half inch.

The particular danger to the child in delivery through a flat pelvis is fracture of the skull from pressure of the promontory or the forceps, and asphyxia, either from interference with the circulation of the cord, hemorrhage into the respiratory center, or delay in extracting the aftercoming head. The maternal prognosis is that of any severe operative delivery, is relative to the amount of physical injury, shock, hemorrhage, etc., and

dependent upon the strictness of the surgical technic or skill of the operator. In view of the medicolegal questions that sometimes develop from fatalities in these cases, the responsibility of their management should be shared with an expert consultant, so far as is possible.

A CASE OF CYCLOCEPHALUS IN GUAM.

BY

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(With one illustration.)

THIS case was the ninth child born to a healthy woman. Father suffering from the disease here known as Gangosa. All other children alive, well and normal. Youngest almost two years of age and oldest over thirteen years. This child, a full-term female, was born on the morning of March 25, 1906, and lived for forty-six hours.

Examination, a few hours after birth, showed normal trunk and limbs, respiration and heart sounds normal. Head greatly elongated from lower orbital border to chin, flattened vertex ending in a pointed occiput. Eyes normally formed, but placed on greatly divergent axes and extruded so that the lids failed to cover. Nose represented by a long tab of skin and soft parts with no median division. Nostrils represented by one small opening directed almost horizontally backward, placed in the median line and reaching the posterior naso-pharynx. Forehead absent, the frontal bones sloping directly backward from the superior orbital ridges. This is well shown in the photograph. Mouth and pharynx normal. Ears normal in appearance externally. Scalp very loose over the posterior portion, occiput and neck. Weight, about six pounds.

Post mortem, performed eight hours after death.

Examination of the trunk revealed all the organs in normal position and condition, except that the heart lay in the median line, being almost entirely covered by the sternum.

The spinal arches were found to be imperfectly closed in the lower lumbar region, giving a slight degree of spina bifida.

Limbs, normal.

Head, fontanelles entirely closed. Posterior ridges of skull greatly thickened, especially occipital ridges, the superior curved line measuring almost three-quarters of an inch. It was over this same region that the great looseness of the scalp noted during life was most marked.

On removal of the skull cap the membranes were found to be very thick.

The brain was represented by one large lobe filling the entire upper and anterior space and one smaller lobe occupying the



Cyclocephalus.—The tranverse line on chest is caused by cord by which body was suspended.

lower and posterior portion of the skull cavity. Neither of these lobes showed the slightest differentiation into any of the parts, nor were convulsions or gyri present. On section, the anterior portion showed one large opening which extended laterally to a margin of brain matter about three-quarters of an inch in thickness. This opening extended downward and into the spinal canal and was filled with a serous fluid. The walls were thickest posteriorly and inferiorly. No signs of any differentiation into

parts could be seen on section. The posterior portion on section showed a general mass of brain matter, but no fluid or cavity. There was the same lack of differentiation present as in the anterior part. The ventricular cavity in the anterior portion was lined throughout with smooth walls without any differentiation. The internal wall of both orbits was lacking, the vessels and nerve from each eye joining about an inch from the posterior surfaces of the eyeballs. This single bundle entered the anterior lobe, above described, in the median line.

THE FETICH OF THE OVARY.*

BY

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WHEN accessory organs are taken out of their subsidiary position by the surgeon and given a determining function that controls all other organic life, it is about time that physiology and pathology from the surgeon's standpoint should be given a careful review. About this we gynecologists are sadly at fault. We know nothing of physiology. Many as have been our opportunities of studying the physiology of organs that give us the most concern, we have absolutely neglected them, and we stand to-day in the position of thirty years ago.

With this paper in view I have been over some of the text-book literature. Of clinical physiology there is a little of no special value, of demonstrative physiology there is absolutely nothing. Here is a virgin field for someone to exploit.

It is due to this want of knowledge that, surgically speaking, we have been led into many errors. It was this ignorance that caused the false position of Battey and the evil influence of Tait. It has led Fellows to make assertions at our annual meetings, and of them I am one, that we have been obliged to retract. It is about time that we called a halt and looked the ground over carefully. The science of gynecology, if it is a science, has been in existence too long for us to plead ignorance of the physiology of the few organs involved in our special work.

Let us confine our inquiry to a single organ, the ovary. I

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do not claim that I know anything more about the ovary than any other Fellow here; as a matter of fact I have no doubt that there are many here who know more than I. What I know of the ovaries is drawn from their clinical relations and dual functions as we are able to interpret them. These are within the experience of anyone who will take the trouble to observe them. But this, at the best, is only superficial knowledge, for unfortunately we know but little of sexual physiology. I must then appeal to clinical experience.

An almost universal explanation of pelvic pain in women is inflammation of the ovaries. The left-sided pain so commonly complained of is usually explained to the patient as due to this cause. The extent of this painful area is from the pubic ramus to above the anterior superior process. Its usual seat is about midway in the iliac fossa; a region in which the ovary is never palpated. Another painful region is from the crest of the ilium to the lower costal border on the left side. How this can be brought within the limits of ovarian influence it is difficult to say. The common error is to confound an extension of pelvic peritonitis to the fossa with an inflamed ovary. We may have a high degree of pain and tenderness at this point with a minimum of uterine fixation and with no very evident mass. To confound ovaritis with inflammation of its peritoneal envelope is simply a state of mind. The great rarity of inflammation of the ovarian stroma and the frequency of limited peritonitis at the open ends of the Fallopian tubes ought to cause a discrimination in the choice of terms. There are no figures that are reliable concerning the frequency of inflammation of the ovarian body, but that it is seldom met with we all know, while peritonitis at or about this region is placed by some authors as high as 50 per cent.

Uncomplicated parenchymatous ovaritis is not a painful disease. It is comparable to that of an orchitis or epididymitis when well supported and the patient bed-fast. The termination of ovaritis in abscess is very rare. In forty years I have never seen a case. The organ can lie in a bed of pus without its substance being involved. It cannot be palpated with any more certainty than the normal organ. These organs are subject to periodical congestions, the pain of which is rarely referred to this region, but is central, sacral or cerebral.

How frequently has castration, within the experience of all

of us, failed to relieve the painful psychosis which we so confidently referred to the ovary. In the localized subjective sensations of women it plays but a minor part. Idiopathic inflammation of the ovarian intima is so rare that it has no place in even the most elaborate treatises. Kelly and Pozzi give it no place, and yet "inflammation of the ovary" is a stock phrase. Gonorrhea is probably the severest pathological trial to which the female pelvic organs can be subjected. We do not find that the ovary takes part in the disease process. The tubes and the cellular tissue of the fossa receive the drainage, while the ovary escapes. The painful sequelæ are largely credited to the ovary, while adhesions and the contraction of evacuated abscess cavities are alone at fault.

Small multiple cysts of the ovary do not appear to give rise to any symptoms. Thousands of ovaries have been sacrificed on their account. The ovaries in any woman who has menstruated twelve or more years are battered, wrinkled-appearing organs and it needs some experience to enable one to say that they are normal. We now know enough to conserve the organ, but we must not suppose that the day has passed when the normal organ is ablated. In view of the importance of the ovary, its removal is ridiculously easy, and in the country this is a stock operation to-day. The woman has had these little organs so long accused of being the source of her abdominal pain that she is prepared to believe everything bad that may be said about them, and is only too willing to have them removed.

It is difficult to explain how the average medical mind can explain all pain in the lower abdominal segment as due to the ovary. If the physician will carefully palpate as low down as the pubic ramus will permit, and then try and recall how seldom he has ever had the patient complain of tenderness in this region, he will realize that the ovary is rarely the cause of pelvic pain and never of abdominal. If physicians are not befogged as to the position of the organs, why is appendicitis so frequently mistaken for ovaritis and tubal inflammation in young girls? In sixty cases tabulated by Dr. Hooker of Australia forty were so mistaken. How frequently the ovary has been removed for this cause is a never-to-be-written chapter in the tortuous history of gynecic surgery. The shame of ablating an organ almost vital in its moral reactions for a disease that a dose of castor oil might cure is put upon us and it must be borne.

The frequency with which the ovary becomes disorganized by extensive new growths without giving rise to pain or other subjective symptoms is well known to all of us. In the histories of ovarian cysts that I have examined, women have applied to me for an explanation of why large growths were accidentally discovered in the fossa while they were giving care to their persons and without any suspicion that extensive disease was developing. This can be said of no other pelvic neoplasm, unless it is of the early stage of a cervical epithelioma. The nervous endowments of the ovary are not of a high order. Its nerves belong more to the trophic centers than to the sensory sulcus of the cord. It may be that this is one of the reasons why multiple cystic degenerations and extensive destructive diseases may go on with so few subjective symptoms.

In a critical review of a subject closely allied to this, our colleague, Dr. Coe, says, "The reaction against the wholesale extirpation of normal or slightly cystic ovaries which occurred many years ago was succeeded by a general resort to conservative surgery, which, though a long step in advance, was itself carried to extremes. The same ovaries which were formerly removed were punctured, burned, resected, and otherwise tampered with when (as we now know) they had better been let alone." Concerning intermenstrual pain he quotes Rosner (*La Gynécologie*, June, 1905), "who, after reviewing the various theories that have been advanced, concludes that this phenomenon is really a pelvic neuralgia, without demonstrable lesions, most common in arthritic subjects." Dr. Coe concludes this able review by saying, "We have referred to this subject because it was formerly held (and some observers still claim) that this symptom is always associated with cystic disease of the ovaries, and is therefore an indication for operation." I could cordially agree with all that Dr. Coe states if other organs than the ovaries could be brought within the sphere of neuralgia of these organs, but I do make the claim that it is so rare that, as an explanation of intermenstrual pain, it may be regarded as negligible.

Importance is given to misplacement of the ovaries as a cause of menstrual and intermenstrual pain. I believe that the ovaries, like the uterus, have no fixed normal position. We will sometimes find an ovary adherent to the wall of a neoplasm and carried up to the level of the umbilicus, without a suspicion of

its presence there, its migration having caused no subjective discomfort to the woman.

The mobility of these organs is their factor of safety. In pregnancy, new growths and postural changes, this endowment preserves their function and structure from damage. Great importance was given at one time to prolapse of the ovary as a source of pelvic disturbance. Many yet so believe to the extent of opening the abdomen to suture the organ to what they regard as a normal position. The late Paul F. Mundé invented an ingenious pessary to correct the position, but it proved a failure. So little disturbance is caused by the descent of the ovary into the Douglas' fossa that I believe it is better let alone. I have known the ovary to lift itself out of the fossa. If, however, alteration of the position of the ovary from that approximately normal apparently gives rise to symptoms, it is due to the condition of the parts about the organ.

Tendonous adhesions attaching the inner genitalia to one another or to their environment of bone keep up a fret and tenderness that require a careful discrimination to attribute to their true cause. None of the conditions require an operation for their removal. Pelvic massage, sitz-baths, graduated exercise and treatment to promote as high a degree of health as possible are better than operations. These intra-abdominal operations in weak and anemic women are sometimes badly borne, and leave the women in a worse condition than before.

The palpation of the ovaries in their usual position, the so-called normal, has been referred to in all text-books. All claim that it can be easily done. If it is such a sure and easy manipulation, is it not a little strange that no two authors appear to agree on the method of palpation? Kelly's method would appear to be as certain as any, but it would be prohibitive in the virgin and in that large class of subjects with contracted vaginas. There is no doubt that the authors of text-books are obliged to take positions that the practical man finds to be difficult or impossible at the bedside. I do not believe that it is possible in the majority of cases to palpate the ovaries understandingly without an anesthetic. Even with that aid it would be difficult in the fleshy subject to assure yourself that you had the ovaries under your fingers. The muscular resistance of the abdominal walls of some young and powerful women is

enormous. Anesthesia to its limit is required to obliterate it, and even then it is difficult to feel certain. It is just as easy to think that you feel a thing as to think that you see it. Self-deception is so easy in the difficult diagnostic examination of the pelvis that it is pardonable in the physician and but little worse in the surgeon.

This continuous clamor about the ovaries has its sociological reflex. The attitude of women towards mutilating operations is a strange one. It will in no manner explain her mental status to say that some doctors are careful, learned men and others careless and ignorant. I have always said that every community has the physicians that, from a moral and intellectual standpoint, it deserves. This apathy pervades refined and wealthy communities which are served by the highest professional talent, as well as the poor and ignorant, when the physicians come from the same rank. The truth occupies no middle ground, but pervades all grades of the profession, both learned and unlearned. All alike appear to be equally ignorant of the palpable location of the ovaries, of their relations toward intra-pelvic disease, of their value to the individual and to the community. A woman's ovaries belong to the commonwealth; she is simply their custodian. Without them her life is stultified. Making a guess at figures I believe it to be within the mark to say that the one hundred and fifty thousand physicians of the United States have sterilized one hundred and fifty thousand women. Some of this large number have openly boasted, when the lunacy was at its height, that they have removed from fifteen hundred to two thousand ovaries. Assuming that each one of these women would have become the mother of three children, we have a direct loss of five hundred and fifty thousand for the first generation and one million six hundred and fifty thousand in the second generation. I believe that these figures approximate the truth. If we accept the proposition that ten per cent. of this aggregate represent necessary and helpful surgery we have the truth from my standpoint as closely as it can be stated.

I have yet to see a woman made better in health by the removal of the ovaries. I have scrutinized my own cases most carefully, and the after-results gave rise to a growing suspicion that the ablation of the so-called diseased ovaries was the result of a blunder in physiological surgery. Dr. Battey's operation

led to a flurry of surgery founded upon ignorance of the relations of these organs to the functions of the body. The anemic neurotics whom the operation was supposed to cure needed more ovarian substance instead of none at all. Like a case of thyroidism, in which there is a deficiency or perversion of the internal secretion of the gland; so in these cases the internal secretion, or influence of the ovaries upon the body, was either perverted or below the systemic demands.

I think this has been verified clinically by many of us. There is this to be said, however, concerning the difference between the reaction of ovarian and of thyroid extract; the reaction of the latter is rapid, while that of ovarian extract is exceedingly slow. The anemia will diminish, the neurasthenia will lessen, and the patient will begin to increase in body weight. After oophorectomy we have nothing left but the growing intensity of the evils for the imaginary relief of which the operation was performed.

The sociological relations of the mistakes about the ovaries have been brought into the daily life of the woman. So constantly have they been held up before her as the one evil spot in her anatomy, that she has grown to look with suspicion upon her own organs. Neither the patient nor the average doctor thinks sanely on this subject. The operation is unfortunately a minor one of few, if any, difficulties and with a death rate so small that it may be neglected. The woman appears to give the same value to her ovaries that the doctor does to the danger of the operation. The result is that we have an overwilling surgeon and a pliant patient. If the doctor would recall his experience before operating and the woman were properly instructed about her sexual life, the surgeon of this region would begin to bear a normal relation to the community.

In this connection, while preparing this paper, I have examined a large number of popular books, designed to instruct women, and the authors ignore this topic. Of course, this omission is in the interest of trade. But some time we will have an inspired author, who stands in fear of neither the doctors nor the reviewers, who will give to women the instruction they are sadly in need of. Surgeons will quickly follow the popular demand.

Reforms in medicine have always come from without the profession, I am ashamed to say. In the old days, calomel

was used to salivation and blood-letting to exsanguination. The people rebelled, and quasi-medical organizations were created to combat them. We have the same reform going on in regard to appendectomy. There are not five cases operated upon where there were twenty, five years ago. It was ridiculed and laughed out of court. There was so little science about it that it could not survive ridicule. The same thing will correct the evil of indiscriminate ablation of the ovaries. I will not ask the question with any expectation of an answer; but why can we not make correction and reforms based upon broad intelligence and scientific insight, within our own ranks?

I submit the following tentative conclusions, not for the purpose of gaining your assent, but for the purpose of bringing my views concisely before you.

First, undue importance is given to so-called inflammation of the ovaries.

Second, the ovaries, notwithstanding their widely diffused physical and psychical influence, do not have the paramount reflex power generally accredited to them.

Third, inflammation of the ovarian stroma is an extremely rare disease attended with but little pain and quickly recovered from without sequelæ.

Fourth, any pain in the lower abdominal zone is generally explained by general practitioners and even by gynecologists as due to inflammation of the ovaries.

Fifth, women have been induced, by the insistent picture of alleged ovarian disease, to give undue importance to these organs.

Sixth, the position of the ovaries in the pelvis is a minor matter and unattended by either functional or sensory symptoms; these are due to other pelvic conditions.

Seventh, palpation of the ovaries, when in a normal position, is a difficult technique, accomplished with certainty only in thin subjects with lax abdomens.

BLADDER AFFECTIONS IN GYNECOLOGICAL CASES.*

BY

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THE female bladder is amply protected from any external violence by its anatomical position, situated as it is behind the pubic bone. However, its relations to other organs which are frequently the seat of physiologic and pathologic changes are such that the organ is frequently subjected to injury and disease. During the early months of pregnancy, the enlargement of the uterus at times causes disturbances which greatly affect the functions of the bladder. With the advent of labor certain forces come into play which subject the organ to severe traumatism, terminating at times even in partial destruction of its tissues. Pathologic changes in the uterus and its appendages, as well as growths and inflammatory changes of the broad ligaments and surrounding tissues, may affect the organ under consideration. Diseases of the rectum not infrequently cause disturbances in the bladder. Again, pathologic changes in the kidneys, which pour their products of disease into the bladder, may set up changes in the organ. Disease of the urethra frequently terminates in bladder affection. Vaginal discharges may find their way into the urethra and bladder and precipitate pathologic changes. Nor should the nervous system be omitted in dealing with this subject. Disturbances of the function of the bladder may result through reflex action, the pathologic change being in a remote organ. We frequently, for instance, find disturbance of the bladder function in appendicitis. A movable kidney may be the cause of an irritable bladder. Ulceration and disease of the sigmoid flexure of the colon may have the same effect. Bladder irritation frequently accompanies menstruation.

Finding the range of possible etiological factors in bladder affections so great, it is self-evident that in investigating bladder diseases it is necessary to pay attention to these several causative factors. Given a case of bladder disease, we should en-

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deavor to follow a systematic course of examination of all the subjective and objective symptoms presented by the patient. If, coincident with bladder disturbances, there are present symptoms indicative of disease of other organs, these respective organs should, of course, receive attention at the same time. If the rectum and sigmoid flexure are diseased and bladder symptoms are present, proper therapeutic measures applied to the seat of disease will cause the bladder symptoms to yield also. If the uterus and appendages or the kidneys are the seat of trouble, with their cure the bladder symptoms will also subside. If the nervous system is at fault, the bladder disturbance will persist unless the neurosis improves.

The systematic investigation of bladder affections requires not alone a routine examination but also a careful urine analysis as well as ocular inspection of the interior of the bladder. The use of the cystoscope is to the bladder what that of the ophthalmoscope is to the eye. Inspection of the interior of the bladder will many times shed much light on obscure pathologic conditions in the organ and help to establish a diagnosis. Nor is the value of a microscopic examination of the urine inconsiderable. The chemical examination of the urine of a diseased bladder is of great importance, but the microscope carries the investigation a step further. Urinary sediments and visible particles floating in the urine should be placed on a slide and examined microscopically. Bacteria found in the urine should be stained to establish their identity if possible. It is also necessary in bladder affections to examine microscopically the secretions of the vulva, vagina, urethra, and cervix. Indeed, secretions of the generative tract, swarming with microorganisms, may find their way into the urethra and even the bladder, and thus a bladder affection be perpetuated. Many times with the cure of a urethritis the bladder symptoms will also disappear. The short urethra in the female readily permits the entrance of morbid agents into the bladder, resulting in a cystitis of various degrees of severity.

For ocular inspection of the interior of the bladder the knee-chest position is preferable. Under strict aseptic technique the cystoscope is introduced through the urethra and the interior of the organ inspected. It is not always necessary to cocaine the urethra for this purpose, but extreme gentleness of touch in the manipulations is of comfort to the patient. For the sake of

description, the interior of the bladder may be divided into hemispheres. Besides, there are certain natural landmarks in the organ that can be utilized for the same purpose. These natural landmarks are the openings of the ureters and the urethra. An imaginary line passing through the openings of the ureters may be called the interureteric line. Lesions may be described as being situated above or below this line or to the side of the right or left ureteral openings. With the patient in the knee-chest position the bladder may be divided into a right and left hemisphere by an imaginary line, and these hemispheres into quarters. Thus we speak of the right lower and right upper quadrants of the bladder and the left lower and left upper quadrants. Using some such artificial scheme the location of lesions may be described more accurately.

In affections of the bladder in the female, the disease most frequently encountered is cystitis. The causes of this inflammatory affection are many. The immediate causes are catheterism, gonorrheal vaginitis, and other infectious processes affecting the vulva and urethra. Certain states of the urine and retention are also etiologic factors. The more remote causes may be rheumatism, gout and tuberculosis, and those enumerated above. The various etiologic factors of cystitis provoke the condition by microbic invasion of the mucous membrane of the organ and a subsequent infection. The symptoms of cystitis are at times very distressing, particularly the constant desire to empty the bladder. This desire is so imperative that the action of the bladder cannot be controlled. The patient finds herself engrossed with but one occupation, and that is responding to the calls of urination. The inflamed organ tolerates but the scantiest quantity of urine. In some patients the urine dribbles away involuntarily, and added to her suffering is that of a resulting excoriation of the vulva. The patients complain of a dull pain over the pubes and excruciating pain with each contraction of the bladder, particularly at the end of each act of micturition. Sleep is disturbed, appetite impaired, and a sense of general weakness and prostration is the result. Physical examination reveals a tender organ when the examining finger in the vagina presses on the trigone. There is considerable tenderness in the bladder, particularly on passing the catheter. The urine is cloudy, alkaline in reaction, with traces of albumin due to the pus and broken-down epithelium. On standing, a

heavy deposit occurs in the urine which may be due to mucus and pus. These are classic cases of cystitis, but there is also a form of bladder affection, which for the want of a better term is named cystitis, in which many of the above-enumerated subjective and objective symptoms are lacking. In these cases the desire to urinate is intense and very frequent. The patient is tormented night and day with the desire to urinate. The calls are imperative. In many cases this is the only subjective symptom present. Palpation does not reveal a tender organ. The urine is clear and acid in reaction. Epithelial cells and pus are absent, but the patient suffers intensely. This form of bladder disturbance occurs in the young as well as the old, and is usually due to exposure. Cystoscopic examination reveals an intensely congested trigone, very tender to the touch, and the mucous membrane bleeds very readily. The tiny arterioles are intensely congested and appear to be in danger of rupturing. During the menstrual period the symptom of frequent urination is greatly aggravated. The temperature is normal; rarely elevated, and when a temperature rise does occur it is due to some additional trouble.

The treatment of these cases is at times quite problematical, as the therapeutic measures prove very ineffective. The application of heat and the administration of anodynes is called for. For the past two years I have been using in these rebellious cases the intravesical instillation of adrenalin chloride, diluting the full strength of the preparation about two-thirds. With this therapeutic measure I find that I have much better control of the subjective symptoms that are so distressing and urgent. I was led to adopt this treatment by the cystoscopic appearance of the trigone, which is that of intense congestion and arterial engorgement, as adrenalin contracts the muscular coat of the vessels. The effect is, of course, only temporary, yet the patient experiences a considerable amount of relief, and I have reason to believe that it acts beneficially on these cases. When the solution is first introduced into the affected bladder it causes some burning. This, however, quickly subsides and is followed by relief of pain, while the urgency of urination is lessened.

There is still another form of cystitis where the causative factor is in the organ itself. I refer to the cystitis that is commonly observed in the puerperium. This is always due to traumatism and catheterism. Under certain conditions, such

as a moderately full bladder during the advent of labor, the organ suffers considerable traumatism. This traumatism results in retention. The traumatized organ must further be abused with catheterization and hence the cystitis. In these cases pain is very slight and the urine is usually retained; but these patients are apt to run a slight temperature and their temperature rise may last for two or three weeks. The urine is alkaline, with a heavy deposit of mucus. The bladder epithelium exfoliates to a surprising extent. It is not unusual to see pieces of mucous membrane one-half inch long come away with irrigation. If these pieces of broken-down mucous membrane are examined microscopically they are found to consist of many layers of epithelium. The cystoscope shows an ulcerated condition of the interior of the bladder. The ulcers seldom bleed. Blood cells, however, are always demonstrable in the urine and epithelial and pus cells are found in abundance. For the past few years I have been in the habit of adopting a prophylactic method of treatment for these cases. If a patient in the puerperal state has to be catheterized she is at once given some urinary antiseptic in sufficient quantity to keep the urine free from bacteria, and if the necessity of catheterization becomes prolonged beyond three or four days the bladder is irrigated with a mild solution of potassium permanganate once a day. By this prophylactic measure I have been able to prevent the occurrence of cystitis in such puerperal cases. I have also employed the same method of prophylaxis in post-operative cases where the necessity of catheterization arises.

Besides the types of cystitis enumerated above there are inflammatory conditions of the bladder where the cause lies outside of the organ. There is a cystitis the result of pyelonephrosis and suppurative conditions of the pelvic organs where the bladder becomes affected secondarily. In these cases nothing but the removal of the cause will lead to cessation of the bladder symptoms. The differential diagnosis of these cases is at times quite difficult, and nothing short of a thorough systematic investigation will clear up the diagnosis. I remember a case distinctly where the patient suffered intensely with the bladder. Frequent urination, tenesmus, pain, pelvic discomfort, tender organ—all the cardinal symptoms of cystitis—were present. The urine contained a few blood cells and pus cells, but it was acid in reaction. The patient ran a moderate temperature.

For ten or twelve days the diagnosis of cystitis was entertained. Then occurred stormy rises of temperature, chills and prostration, and finally death. At the autopsy it was found that there was a perinephritic as well as a perihepatic abscess present while the genitourinary tract was free from all inflammatory disturbances.

Under the head of cystitis from foreign bodies we may include also those inflammatory reactions of the bladder that are the result of vesical calculi. Here the calculi by their very presence perpetuate the disturbance, and yet it is interesting to note the remarkable tolerance of the organ for these calculi. For a considerable length of time a stone may lodge in the organ without causing the least disturbance. Sooner or later, however, these calculi will act as a foreign body, and when the bladder becomes infected will give rise to inflammatory disturbances of a very serious nature. Patients with this form of cystitis sometimes suffer a great deal, and even after the removal of the offending stone the inflammation in the bladder subsides very slowly. It is not unusual for these patients to complain of vesical disturbance for months after the removal of the calculi. I have a patient under my care from time to time who suffered a few years ago with a calculus of the bladder. Her bladder was drained for six months. All the inflammatory disturbances subsided; but even now from time to time she is subject to vesical irritation, and her suffering is at times quite intense. For these cases much can be done by way of prophylaxis with the administration of the newer urinary antiseptics. The urine is thus kept free from bacteria and inflammations of the bladder wall can thus be avoided. By keeping the urine antiseptic the growth and development of the bacteria is prevented and not only are the inflammatory reactions of the bladder wall prevented but the deposition of bacteria in the tissue of other parts of the genitourinary tract is also avoided. These drugs are now strongly recommended, for instance, in typhoid fever cases when bacteria leave the body by way of the urine. Here the urine is aseptized and the chance of the formation of nephritic abscess is diminished, which is also true of the more remote consequences of typhoid, such as the subsequent formation of calculi.

The cystitis that is the result of foreign bodies introduced through the urethra needs but a mention. These cases, how-

ever, will be encountered from time to time, and it is advisable to bear them in mind in investigating the cause of bladder disturbance. Foreign bodies may find their way into the bladder by injuries inflicted or by ulceration of bodies such as pessaries introduced into the vagina. These cases, however, are rare, especially now that so few of these supports are worn.

The bladder may suffer rupture. These ruptures may result from traumatism or pathologic states of the bladder wall. In all these cases some form of traumatism is the exciting cause. Pathologic conditions may occasion the weakening of the bladder wall so that a comparatively slight force may cause a rupture of the organ, but the exciting cause will be either traumatism or muscular effort. Serious vesical injuries during labor do not occur now as frequently as formerly. Improved obstetric knowledge prevents such deplorable accidents. Under some conditions, however, bladder injury is almost unavoidable in the more difficult obstetric cases.

Cases of vesicovaginal fistula I shall merely mention, as the subject is so familiar. The etiology, diagnosis, and prognosis and the difficulties encountered in bringing about a cure in these cases are all well understood, and happily these cases are less frequently encountered than formerly.

The bladder is often the seat of neoplasms. These new growths may be benign or malignant. The benign include the papilloma, fibroma, myoma, and myxoma; the malignant are the sarcoma and carcinoma. The papillomata are of two forms, villous polypi and fibropapillomata. In the villous tumors there are numerous wavy branches and polypi which consist of numerous tiny vessels covered with epithelium. In the papillary tumors the base is more solid. The fibromata are rare, while the myomata are more common. Both of these tumors arise from the muscular coat of the bladder. The myxomata are really fibromata that have undergone mucoid degeneration. The myxomata are more common in children. Of the malignant growths carcinoma is the more frequent. In fact, sarcoma of the bladder is considered to be very rare, and even of the carcinomata the secondary ones are more common than the primary. The diagnosis of all these tumors in the early stages of their development is at times quite difficult. As their development, however, progresses, they give enough symptoms, subjective and objective, on which to base a diagnosis. In all these cases the

first prominent symptom that brings them to the physician is hemorrhage. It behooves the diagnostician, therefore, to investigate all these blood losses from the generative tract very carefully, as they may be the signal of grave pathologic disturbance.

Under functional vesical disturbances are included those cases where no local bladder lesions are found, yet the patient suffers with various symptoms referable to the bladder, such as frequent urination, incontinence, and retention. The causative factors in these cases lie in the nervous system. In *tabes dorsalis*, for instance, there may be paralysis without retention, where the paralysis shows itself in a delay in starting to micturate, or there may be a partial retention. In certain injuries of the spine, as, in Potts' disease, the bladder disturbance is entirely of a functional nature.

In gynecological patients there are often encountered cases of incontinence of urine. There are incontinence of the drop-by-drop kind and the intermittent type in which large quantities of urine are passed at frequent intervals. The incessant dribbling may be due to paralysis of the vesical and urethral sphincters. This dribbling may be associated with retention, and if it is so the urine that dribbles away is merely the overflow. If it is incontinence without retention, then the bladder fails to act as a reservoir and the case is one of absolute incontinence. There are, however, cases that are neither absolute nor partial incontinence, and yet a continued dribbling of urine occurs. These are the cases where the bladder has been overdistended and where the anatomical position of the organ is at fault, so-called *cystocele* cases. There are also cases of incontinence where no cause is discoverable, and these are very probably of psychopathic origin.

I shall now take the liberty of citing a case of bladder disturbance due to a small fibroid of the uterus in the anterior wall at the cervicovaginal junction, the only fibroid present in the uterus. The patient, Mrs. C., presented herself with various symptoms, the most prominent of which was incessant bladder disturbance. She was obliged to respond to the calls of micturition almost every hour. During the night the calls were less frequent, but it was not unusual for her to urinate from four to six times a night. This condition had lasted for several months. The patient experienced no pain, no discom-

fort, no suffering of any kind except these frequent calls to urinate. Both chemical and microscopical examinations of the urine proved negative. As the patient was quite stout the bimanual examination also proved negative. Cystoscopic examination with the patient in the knee-breast position showed a perfectly normal vesical interior. Nor did it appear that I was dealing with a hysterical bladder. An examination under ether was requested of the patient and agreed upon. Under the anesthetic, I could make out a well-defined case of adnexal disease and a small, well-defined mass which, on account of its distinctness in palpation, appeared to be in the bladder. At first I thought I was dealing with a case of tumor of the bladder. More mature consideration, however, argued against such a growth. A tumor in the bladder of such a size as the one under consideration should have been sufficiently excoriated on its surface to show epithelium in the urine. In this case the urine was absolutely normal. The conclusion was forced on me that this mass must be outside of the bladder and the laparotomy proved the mass to be a small fibroid. The tumor was pedunculated and no other fibroid was associated with it. Its removal brought relief of the vesical disturbance. This case, I believe, teaches that the bladder may be greatly disturbed by agencies and conditions entirely outside of it, and in dealing with these cases not only the genitourinary tract is to be investigated, but all associated tissues and organs as well.

The treatment of vesical affections in gynecological cases resolves itself into employing those therapeutic measures that are appropriate for the removal of the various etiological factors. An infected bladder must have the infections combated, the source of the infection removed, and if necessary, the organ put at rest by providing a free outlet for the urine. The infection is best combated by the use of mild antiseptic solutions, by administering urinary antiseptics, by anodynes, application of heat, and enforcing rest on the patient. If the cause of the vesical disturbance is the kidney pouring its pathological product into the organ, this source of the infection must be removed. If calculi keep up the trouble the organ must be freed of them and the damage the calculi inflicted must be treated accordingly. The treatment resolves itself into accurate diagnosis. A precise diagnosis will resolve itself into a successful treatment. The treatment, however, of bladder affections becomes at times

very tedious and far from satisfactory, and this is notably so in cystitis. The more acute cases tend towards recovery, but once the cystitis has become chronic the problem is more difficult. The treatment resolves itself into medication, irrigation, or instillation and topical application as well as surgical treatment. With medication we tend to bring about sedation as well as to prevent the growth of bacteria and to diminish their number. With irrigation we cleanse the organ, remove offending discharges, etc. The topical application carried out under direct vision is a great advance in the treatment of the more chronic form of cystitis. An important and valuable method of treatment has been recommended by Clark when he introduced his so-called vesical balloon for the treatment of chronic cystitis. By means of this balloon the medication is brought into direct contact with the diseased tissue, and I believe also that its beneficial effect is of a mechanical nature. It compresses the tiny distended arterioles in the mucous membrane of the bladder, which tends to empty them, and in that way favors resolution and the absorption of pathologic products. Dr. Clark gives a description of the balloon and the technique of its use in the *Johns Hopkins Hospital Bulletin*, February and March, 1896. The prophylactic treatment of cystitis is an important consideration. Given a case where catheterism is unavoidable, the cystitis that is so apt to follow the artificial evacuation of urine is prevented by the administration of one of the newer urinary antiseptics and, if necessary, irrigation of the bladder with a mild antiseptic like boric acid solution or a mild potassium permanganate mixture. In puerperal and post-operative cases this measure will save the patient much annoyance if not suffering, and a greater or a less period of invalidism.

I now report a few cases of bladder affections:

CASE I.—Mrs. H., aged 34, presented herself with the following symptoms: Frequent and painful urination, bearing-down pains and tenesmus, backache and headache. Sleeping poorly. She was obliged to pass water very frequently: every two hours, sometimes every hour. The day before her visit to the office she urinated fourteen times by actual count. She got up two or three times during the night. Only small quantities were passed at a time. For the past three months she had been passing blood with the urine. Patient was positive that the blood did not come from the vagina. She was anemic, but otherwise in

good condition. Appetite fair. She had had three children. Her menstruation was normal; it lasted from four to five days, was of moderate quantity, with some cramps the first day. During menses the bladder was more disturbed. There was some vaginal discharge, but not excessive.

Patient had been under treatment for past six months. Her bladder had been irrigated frequently. She had also taken medication. At first as a result of the treatment she improved greatly. For the past three months, however, she had done very poorly, and as blood made its appearance in the urine she was referred for examination and operation, as a diagnosis of polypoid growth in the bladder was made. Physical examination of the chest was negative. There was no prolapse of kidneys. Bimanual examination showed the uterus in position. Cervix and perineum lacerated, cervix cystic. Palpation revealed an excessively tender bladder and urethra. Broad ligament and uterine appendages normal. Urine was drawn off and preserved for examination. The introduction of a glass catheter into bladder caused considerable pain. Tenesmus followed the withdrawal of the urine. The vesical sound disclosed a bladder of some depth. The examination was followed by some bleeding. Palpation of the base of the bladder through vagina caused great pain. Patient was placed in the knee-breast position. The No. 9 cystoscope was introduced, no cocaine used. On withdrawing the obturator, considerable bloody urine escaped. Cystoscopic examination revealed the base of the bladder intensely red, the blood-vessels standing out very prominently. A little to the right of the orifice of the right ureter there was an irregular denuded surface which was bleeding. The trigone was very red. The mucous membrane of the organ at the summit was fairly normal, the blood-vessels were engorged. In withdrawing the cystoscope the neck of the bladder was found to be very red, two or three bleeding points were seen, apparently fissures and cracks. The urethra was very red, not as much at the meatus as at the sphincter of the bladder. The patient was placed in a lithotomy position; bladder was irrigated with potassium permanganate solution, 1-2,000. The irrigation caused considerable pain. Only about four ounces of solution could be held in the bladder. The irrigation was followed by introducing two ounces of a 20-per cent. solution of ichthyol and water. The patient was asked to sit

quietly and bear the pain for a few minutes. She could retain it only for eight minutes, when it was allowed to be passed voluntarily. The patient was ordered to take $7\frac{1}{2}$ grains of urotropin t. i. d. dissolved in a glass of cold water. Three days later the patient reported that the frequency of urination was the same. She had less pain than formerly. There had been no blood in the urine. Before irrigating the bladder the urine was drawn with a steel catheter. The specimen of urine was quite clear. It was free from bacteria and no blood corpuscles were found. Pus and epithelial cells were, however, present. The treatment outlined above was continued. Two weeks later another cystoscopic examination was made. The local condition in the bladder was about the same as at the first examination, except that there was no bleeding following the examination and the urethra was less red and congested. The following line of treatment was instituted. A vesical balloon was introduced into the bladder through the cystoscope. The balloon is a bag of very fine rubber. To the bag is attached a rubber tube. When the rubber bag is in the bladder the cystoscope is withdrawn. A 10-per cent. solution of ichthyol and water is now introduced into the bladder through a catheter. The catheter is slipped into the bladder by the side of the protruding rubber tube. The rubber bag is now inflated by means of a hand bulb. The inflation of the bag causes considerable pain at first, but this soon subsides. The amount of inflation depends on the degree to which the distention of the bladder can be carried. Five or six compressions of the bulb is all that will be tolerated at first. Later in the treatment the vesical balloon can be distended more and more. The object of the vesical balloon is to distend the bladder and bring the medication in contact with the mucous membrane of the organ. The patient is now allowed to sit down or recline on a couch if preferable to her. If possible the balloon should be retained from fifteen to twenty minutes. At first the patients will not retain it longer than five or six minutes on account of the discomfort and pain which it causes. The removal of the bag is effected in the following way: The patient is placed in the lithotomy position; the air is allowed to escape from the balloon. Gentle traction on the protruding tube will bring away the rubber bag. The medicine that was introduced into the bladder is allowed to remain unless it causes too much discomfort to the patient, in which case it should be removed

and the bladder irrigated with a little salt solution or even plain hot water. The relief that follows vesical ballooning is sometimes truly remarkable. In the patient under consideration the relief was great and she gladly subjected herself to further treatment, although the procedure is somewhat painful. After six treatments, extending over a period of three weeks, the patient expressed herself cured. A cystoscopic examination at this date showed the congestion of the trigone greatly reduced, but the ulcer was still present. The patient was advised to continue with the urotropin to keep the urine antiseptic. She was also asked to present herself for treatment. She did present herself, but did not take treatment as she considered herself entirely well. The pain has disappeared. She urinates normally. The frequency of urination and quantity of urine are normal. The urine is clear. Pus and bacteria have disappeared. It is very rarely that the patient rises during the night, and when she does it is usually the result of indulging in beer before retiring. The causative factor of the cystitis in this case is not known, but the cystitis may have been due to exposure, or it may have been the result of an extension of inflammation from the urethra, the urethritis having been caused by an excessive leucorrheal discharge, which seems to have been present previous to the bladder disturbance.

CASE II.—Mrs. R., aged 32, mother of one child, presented herself with the following symptoms: Frequent micturition, at times as frequently as eighteen times in twenty-four hours. This marked frequency resulted from the fact that she was unable to empty her bladder completely. Were she able to do so, the frequency of her urination would be considerably less. The patient complained of pain and sensation of heat in the bladder. Considerable tenesmus and bearing-down pains. Her infirmity compelled her to remain at home all the time. Her physical suffering was great, and the anguish of the mind was responsible for the depression of the spirit. Her sleep was greatly disturbed by the calls for urination. Her general health was fair, her appetite tolerable. The specimen of urine the patient brought was cloudy, and numerous fine particles could be seen floating in it. The patient gave the following history: Her bladder trouble began three years ago, with frequent urination. There was no pain at that time. She consulted a physician, who diagnosed the case to be one of cystitis. The treatment consisted of

irrigation of the bladder, internal medication, and the application of silver nitrate solution. She did not know the strength of the solution, but the pain and smarting as a result of this application would at times be agonizing, and the suffering would last for three or four days after each treatment. After several months of treatment, seeing no improvement, she was referred to a consultant. The consultant concurred in the diagnosis of cystitis, advised application of silver nitrate in mild solution, bladder irrigation, and free indulgence in water and lithia. Although she was treated persistently and conscientiously she derived no benefit from it. By this time the patient was greatly discouraged, as she considered her trouble to be incurable. Her suffering has increased, for whereas before she was only troubled with frequent urination there were added pain and burning in the bladder which would, however, yield to hot sitz-baths. She then entered a hospital. The treatment at the hospital consisted in frequent irrigation of the bladder, salol internally and local application of pure carbolic acid to the urethra. These applications the patient declares were so painful that it is impossible to describe the suffering. She submitted to it because she thought that something had to be burned away. After several months of treatment she left the hospital unimproved. She then abandoned all treatment, contenting herself with the relief the sitz-baths gave. She drank water freely. The pain, bearing-down and burning sensation in the bladder would at times greatly mitigate, but the frequency of urination seldom did.

On presenting herself for treatment I found her urine as follows: Specific gravity, 1.020, acid, no albumin, no sugar, no pus, no blood corpuscles, but a large quantity of epithelial cells swarming with bacteria. Physical examination negative, cystoscope showed a few fissures at the neck of bladder and intensely congested trigone and urethra. No ulcers present. Bladder was irrigated with mild permanganate solution; urotropin, 30 grains daily, ichthyol instillation. Four days later, as no improvement appeared, the vesical balloon was used with a 20-per cent. solution of ichthyol. Some improvement was noted. Two days later the balloon was again used, but instead of ichthyol a solution of adrenalin chloride was instilled into the bladder. A decided improvement followed this application. All her symptoms improved, and after six months' treatment the pa-

tient considered herself well enough to discontinue treatment. In both of these cases of chronic cystitis the balloon proved itself to be a curative therapeutic measure.

159 WEST ONE HUNDRED AND TWENTIETH STREET.

EXCISION OF A V-SHAPED PIECE OF THE POSTERIOR UTERINE WALL FOR ANTEFLEXION OF THE CERVIX WITH THE AID OF AN INTRA- UTERINE HOLDER.

BY

R. C. COFFEY, M.D.,

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(With two illustrations.)

In the July number of THE AMERICAN JOURNAL OF OBSTETRICS AND DISEASES OF WOMEN AND CHILDREN, Dr. W. H.

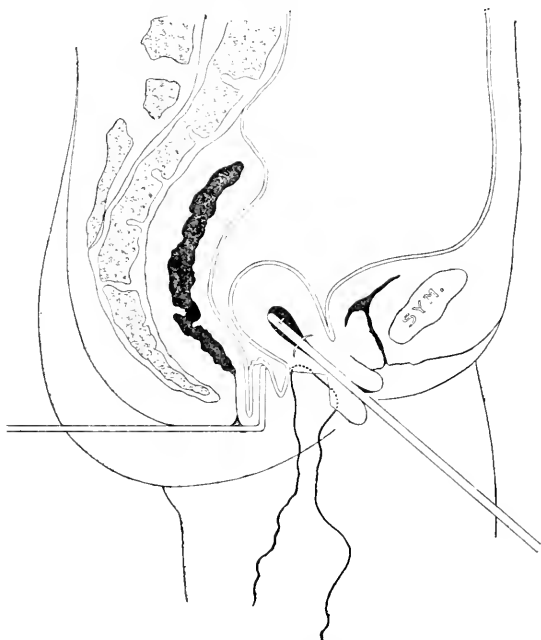


Fig. 1. Uterus held down with "cat-claw tenaculum." Posterior vaginal wall held back by retractor. Vaginal incision has been made posterior to the cervix, dissecting up the peritoneal coat. Suture for closing V-shaped incision, inserted.

Baker describes an operation under the heading, "A New Operation for Antelexion of the Cervix." I have had good results from an operation somewhat similar but performed by a slightly different technique, which I wish to describe by the accompanying drawing, Fig. 1. The steps in the operation are: First, pull down the cervix and uterus with bullet forceps or double tenaculum. Second, insert the "Cat-claw tenaculum," Fig. 2; protrude the fangs and pull the uterus down as far as possible. Third, incise the vaginal mucous membrane at the back of the cervix and dissect up the peritoneum on the posterior surface of the uterus far enough to excise the wedge. Fourth, close the V-shaped incision with strong three-weeks catgut sutures.

The operation as illustrated was first performed by the writer on a patient of Dr. W. C. Gilmore of Oakland, Oregon, in September, 1902. The mechanical result was perfect. The patient

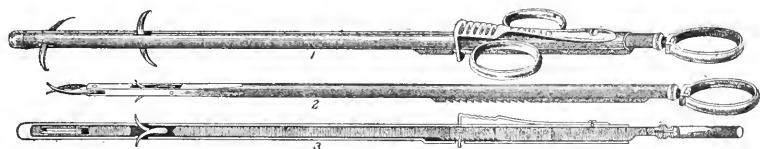


Fig. 2. (1) "Cat-claw tenaculum" with fangs protruding for holding. (2) Central rod showing ratchet and method by which fangs are hinged. (3) Cross section showing mechanism by which fangs are protruded through the eyes of the tube. By pressure on the spring the ratchet is relieved, when the fangs may be withdrawn by pulling back the central rod.

was married four months afterwards and bore a child ten months later. My second case, a patient of Dr. Elsie Patton of Portland, was done March 19, 1904, with good results. Since that time I have performed the operation three times, doing in all five operations by this method, with uniformly good results. Reed and others have accomplished the same result by excising the V-shaped piece from above, but I am inclined to believe with Dr. Baker that the operation of choice should be one such as he described, performed by any technique which may be convenient to the operator. In two of my operations, I opened the peritoneum but noticed no evil results. I have not experienced any difficulty in performing the operation by the method shown in the diagram, and am of the opinion that the use of the instrument illustrated in this paper, for intra-uterine holding, makes the operation easier.

INTUSSUSCEPTION.

BY

G. BROWN MILLER, M.D.,

Washington, D. C.

(With one illustration.)

THE difficulties encountered in making a diagnosis in two cases of intussusception occurring in adults and running a chronic course have induced me to report them in detail.

The first case was as follows:

Mrs. T., aged 64 years, was seen by me in consultation with Dr. Hardin, December 16, 1905. Her past history was negative except that at the menopause, 15 or 20 years ago, she had had rather profuse menstruation. She had suffered for the past few years with muscular rheumatism. She had contracted a bad cold a few days before the attack.

The present illness began suddenly in the night of December 14 with violent abdominal pain, nausea, and diarrhea. The nausea and vomiting were most violent, the vomited material running from her mouth, at times, without straining. The pain was described by her as very severe. The diarrhea was also marked. Her son, a physician, noticed that the vomitus and the stools both contained a few dark particles which he thought were blood. When seen by her family physician, Dr. Hardin, the next morning she did not appear to be very ill. She was still suffering from diarrhea and abdominal pain, but the nausea had largely subsided. A careful examination of the abdomen showed nothing abnormal except an increased tenderness. The temperature was not elevated and the pulse was good. She was thought to have an attack of acute indigestion and was given some castor oil. The nausea subsided but the pain and diarrhea continued. The next morning her physician, on examining the abdomen, found it moderately distended, with a tumor mass occupying the whole lower abdomen below the umbilicus. When examined by me later in the day her condition

*Read before the Washington Obstetrical and Gynecological Society, March 16, 1906.

was as follows: A healthy looking woman with good color, tongue somewhat coated, but moist and not reddened, pulse, 90-100, temperature, 101° F., respiration, 16-18. Nothing definitely wrong could be made out in the chest except that the heart was somewhat enlarged. The abdominal walls were fat and pendulous, the fat being about 2½ to 3 inches thick. There was no visible peristalsis of the intestines. The abdomen was somewhat distended and tympanitic. Occupying the lower part of the abdominal cavity and extending to the level of the umbilicus was a tumor mass which was rather more prominent on the left side. This mass was fairly firm and extremely tender, but owing to the thick abdominal walls its outlines could not be sharply defined. It was dully tympanitic on percussion, and rather loud gurgling could be made out on auscultation over it. There was definite spasm of the abdominal muscles. Vaginal and rectal examinations showed the uterus rather far back in the pelvis and not freely movable. It could not be definitely determined whether the mass formed part of the uterus or not, but it gave the impression, which was confirmed by several subsequent examinations, that the mass overlay the uterus whose mobility was decreased by the resistance of the abdominal walls to movements of the mass. The following day the tenderness and fulness were greater in the right side of the abdomen and the question of acute appendicitis was broached. With this exception the tumor and tenderness were always more apparent on the left side. The advisability of operation was considered; but the indefinite nature of the trouble, the patient's strong opposition to operation, and the fact there were no urgent symptoms made us defer it. She had at this stage frequent micturition, and the urinary analysis showed a very faint trace of albumin, but no pus or casts were noticed in a sedimented specimen. She continued about the same for a few days, and was seen by Dr. I. S. Stone, who advised against operation. About the fifth day of her illness she grew extremely restless during the night, became slightly cyanosed, with sighing respiration, and very rapid (150-160) and irregular pulse, many impulses not being transmitted to the wrist. Her appearance next morning was fairly good, there being no apparent dyspnea, color rather pale. A careful examination of the heart showed a moderate enlargement and a soft systolic murmur near the apex. There were no signs of involvement

of the lungs except a slight cough. After consultation with Dr. Stone and Dr. Claytor it was decided that the condition of the heart was nervous in origin and she was given small doses of morphine at intervals of a few hours. She soon got under the influence of the drug, as shown by drowsiness and contracted pupils, but without any effect on the irregular cardiac action. Digitalis was next tried and after fifteen to sixteen hours the heart action became regular and slow. During the whole time of its irregularity there were no marked signs of want of compensation except at the beginning of the attack. She continued in this condition, with a fairly regular pulse of 80 to 100, temperature 99° to 102° for eight days, when she had an attack similar to the first except that her respirations became more rapid (24-40), and her mind was at times wandering. Digitalis had apparently no effect on the heart's action. After thirty-six hours the heart again became regular and slow. The blood at the second heart attack showed a moderate leukocytosis (12,300) and after a few days the count was 8,600. Widal's test was negative. The urine became decreased in amount and showed on examination a slight trace of albumin, and a few hyaline and many granular casts. One stool at this time was noted to be of very foul odor. She complained continually of soreness and pain in the left lower abdomen, but the pain was not marked. The tumor was noticed by Dr. Hardin and myself to change its shape and size, depending somewhat upon the movements of the bowels. I once noticed the mass extending well up the left flank in the position of the descending colon, and on the next examination this portion had disappeared. Dr. Hardin also noticed on the left side of the abdomen a prominent portion of the tumor, which could be grasped between the hands. This had disappeared at our next visit. Intestinal peristalsis was never violent, and owing partly to the thick abdominal walls it gave little information concerning the nature of the malady. During the second heart attack she complained rather suddenly of severe aching pain in the right leg which continued for a few days. The leg from the knee to the foot became swollen and very firm. There was no pitting on pressure, however. The skin over it had a slight flush. The anterior and posterior tibial arteries were apparently not obliterated. The pain subsided in a few days and within a week the leg was again of its normal size. The urine was voided very frequently and the

stools were quite offensive. After this she had, at times, numerous chilly sensations but never a distinct chill. January 3, she had several very offensive stools and in one of them passed some tissue. This proved to be a tube of seminecrotic tissue about $2\frac{1}{2}$ inches long and the thickness of an appendix, closed at one end and open at the other. The closed end contained a fecal concretion the size of a large pea. Attached to the side of the tube was some tissue, the whole giving the appearance of the vermiform appendix with its mesentery. Microscopically no definite structure was to be made out. It was undoubtedly the vermiform appendix with its mesentery which had sloughed off. The offensive stools continued for several days, and recurred at intervals until January 23. The diarrhea, or rather frequent movements of the bowels, continued for several weeks. Her temperature remained slightly elevated, running between 99° and 101° until February 20. The pain and tenderness gradually subsided, and the tumor mass gradually decreased in size until at the last examination (March) there could be felt only a slight indefinite fulness in the lower abdomen and apparently not connected with the uterus. There was at this time a slight tendency towards diarrhea. Her strength gradually returned. After getting out of bed there was some swelling of the right leg with tenderness in the calf, and an occasional twinge in the groin. A letter from her son, June 1, states that she is quite well.

The case just detailed was to me most interesting and, especially in the early stages, very puzzling from the standpoint of diagnosis. I finally concluded that there was an intussusception. It did not correspond to the usual description of the disease.

We usually depict to ourselves the following clinical picture when we think of intussusception: A disease of childhood beginning suddenly with intense pain in the abdomen, collapse, violent vomiting and diarrhea (the vomitus and stools containing blood), complete occlusion of the bowels with distention and finally fecal vomiting, the formation of a sausage-shaped tumor, and death in a few days unless the intussusception is reduced. We will consider these symptoms separately.

Pain is never absent. It usually comes on suddenly and is very severe. Its character is generally colicky but occasionally it is continuous or there may be irregular intermissions. In chronic intussusception spasmodic pain may torture the patient

for days with intermissions. In such cases one sees at times increased peristaltic movements of the intestines, with stiffening and rigidity of certain loops of the bowel. Loud gurgling may be heard in the intestine and the attack may be relieved by the passage of the gas and fecal material causing the sounds. These contractions and stiffenings of the intestines occur in those frequently dilated and hypertrophied loops of the intestines above the invagination. Tenesmus may be marked.

Vomiting is by no means a constant symptom. In acute cases it occurs as an initial symptom but in chronic cases it is frequently altogether absent. After the initial stage it depends largely upon the degree of occlusion. The onset of the disease may be acute and may be accompanied by vomiting as one of the initial symptoms; then the vomiting may cease altogether if the case runs a chronic course and may never recur up to the recovery or death of the patient. Rafinesque's statistics on the frequency of vomiting in those forms of invagination which run a chronic course show that it occurred in only 3 out of 40 cases.

The evacuation of the bowels and the character of the stools are most important. In most acute cases there are, at first, frequent evacuations, consisting in the beginning of fecal material, and later of blood and mucus in cases where there is complete obstruction. The more acute the case and the more violent the strangulation the more pronounced will be the hemorrhage from the bowels. Nothnagel says that in 20 per cent. of all cases there is never any blood in the stools, and that in chronic cases it is present in only 45 to 50 per cent. Rafinesque, in 46 cases of chronic intussusception, found the following results: In 7 instances the stools were normal; in 16 cases diarrhea predominated; in 12 cases constipation was a marked feature; in 11 instances diarrhea and constipation alternated. Complete interruption of the lumen of the bowels does not by any means occur in all cases of invagination. In many instances the bowel contents can pass along, and in these instances there is true diarrhea, for in addition to the irritating intestinal contents the bowel is in a state of violent peristalsis. When the intussusception begins to slough the stools have a gangrenous odor. The abdomen may be retracted, especially in the early stages, or it may be normal on inspection. Later there is distention which varies according to the degree of obstruction and seat of the stricture.

Tumor. One of the most characteristic clinical features of intussusception is the formation of a tumor. Leichtenstern in 423 cases found a tumor in 222 of them, while Rafinesque in 53 reported cases of chronic intussusception found a tumor mentioned in 24 of them. Its absence may be accounted for by its position, by the thickness or tenseness of the abdominal walls, or the tumor mass may be so insignificant that it is overlooked. It varies greatly in size, and in chronic cases the size may vary from time to time, due to the accumulation of fecal matter above it. It is generally cylindrical or sausage-shaped. Its outlines are generally indistinct, although in some cases the tumor can be grasped by the hand. Its consistency varies from time to time but it is not stonily hard. The following phenomena are sometimes observed:—a tumor may be very hard and yet become comparatively soft in a few minutes; the tumor may in this way vanish in a short time, and it is frequently surprising to palpate a hard distinct tumor and to find a few minutes afterwards that no tumor-like resistance whatever can be felt in the same region. The disappearance of the tumor and the changes in its consistence and position are due to tetanic contractions of the intestinal wall above the seat of constriction. The position of the tumor varies greatly. Leichtenstern found the tumor most frequently situated in the region of the sigmoid flexure, and then in point of frequency in the following places: prolapsed and protruding from the anus; in the rectum; in the region of the cecum, of the descending colon, the transverse colon; lastly in the hypogastrium. The tumor may remain permanently fixed in one position by adhesions. Peritonitis is liable to occur on the second or third day. In rare cases the peritonitic processes lead to the pouring out of an exudate.

Statistics by Weiss in 32 cases of intussusception showed that in those which occurred in the adult ileac formed 29.5 per cent.; Meckel's diverticulum, 4.5 per cent.; ileocecal, 34.5 per cent.; ileoecolic, 4.5 per cent.; colic, 27 per cent. Leichtenstern in 125 cases found that sloughing occurred before the fourth week in 94 of them, 3 times after the sixth month, and in only isolated cases later.

Terminations. Death may be due to shock or collapse, to occlusion of the bowel, to gangrene with resulting peritonitis if sufficiently strong adhesions have not formed (the slough-

ing usually occurring about the third week), to septic processes, to thrombosis of the mesenteric vessels, to abscesses, and to colliquative diarrhea from ulceration. The patient may recover by a reduction of the invagination, or the invaginated part may slough away, leaving the peritoneal surfaces so adherent that the peritoneal cavity is protected.

Kelly, in his book on appendicitis, has analyzed 20 cases of intussusception of the vermiform appendix. Only one case occurred in an adult, this case occurring in a woman 40 years of age. In all of his cases there was an invagination of a portion of the intestine along with the appendix. Occasionally only a portion of the cecum was invaginated, but in the great majority of the cases the lower portion of the ileum and the beginning of the large intestine were also invaginated. In a few of his cases the appendix was inverted, *i.e.*, turned inside out.

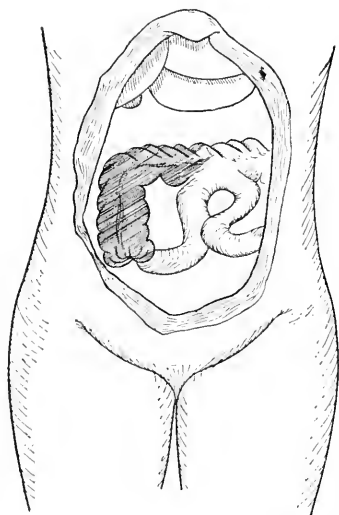
Having given a synopsis of the symptoms of intussusception let us return to our case and see if we can account for the various symptoms which she had.

The sudden attack beginning with severe abdominal pain, vomiting, and diarrhea coincided with a typical case of intussusception. The dark particles in the vomitus and in the stools may or may not have been blood; but if so, followed the rule in these cases. The violent vomiting at the onset with cessation after ten to twelve hours is perfectly consistent with the symptoms as given by writers on the subject in cases where there is not a total occlusion of the bowel. The continuous diarrhea with an offensive odor to the stools after the first five to six days also coincides with the statistics on the subject. Nothnagel says that in 20 per cent. of the cases there is never any blood in the stools, and it occurs in 45-50 per cent. of chronic cases. Complete interruption of the lumen of the bowel does not occur in by any means all cases. In many instances there is true diarrhea, the violent peristalsis tending to cause the frequent expulsion of fecal material. The ulceration and necrosis also tend to produce a colliquative diarrhea. The offensive, gangrenous odor is also characteristic. Can we account for the condition found on examination of the abdomen? The character of the tumor was such that I was convinced early in the course of the illness that the condition was intestinal. The tumor was indefinite in outline, dully tympanitic; changed its size and shape

to a certain extent; was the seat of loud gurgling; overlay the uterus and was apparently not connected intimately with it. Its position and size were the most difficult things for me to explain. The mass occupied the whole lower abdomen and was most apparent on the left side. According to Leichtenstern the tumor of an intussusception is most frequently found in the region of the sigmoid flexure of the colon (due probably to a considerable length of the invaginated portion in the ileocecal variety). In our case I believe the mass to have been made up partly of an inflammatory exudate with an adherent omentum and intestines. Its changes in size and slight change in position were probably due to tetanic contraction of the intestine and the accumulation of fecal matter above the point of constriction. The prominence of the mass in the left side was possibly due to the intussusceptum extending to the sigmoid flexure, although this may not have been the case. The position of the tumor in the lower abdomen did not correspond to the normal position of the transverse colon, being too low down. Of course there may have been an abnormally low situation of this portion of the colon. I believe, however, it was partly due to a peritonitic process with an exudate, to adhesions of the omentum, and to an abnormally low situation of the colon. The changes found in the urine were probably an exaggeration of a chronic nephritis due to the condition of the intestine, nephritis frequently accompanying intestinal obstruction. The heart condition was one of the most interesting phases of the illness. Was it a purely neurotic heart? I cannot think so. The abrupt onset with symptoms of shock, sighing respirations, slight cyanosis, restlessness, and irregular and peculiar character of the pulse, which did not respond to morphine, and the second attack beginning in the same way and associated with appearance of a thrombotic or embolic process in a blood-vessel in the right leg impel me to believe that the heart's rapid and irregular action was probably what the Germans call "Kletterpuls," which they regard as indicative of the formation of a thrombotic process. I think it not unlikely that this condition is due to the passage through the heart of comparatively small emboli. The discharge of the necrotic appendix with its mesentery, preceded and followed by stools with a gangrenous odor seems to me to clinch the diagnosis that there was at least an intussusception of the vermiform appendix. As in every case of the

20 collected by Kelly in which the appendix was invaginated there was likewise an invagination of the cecum, or cecum and ileum, I believe we can conclude that our case was one of an intussusception of the ileocecal variety which included the appendix.

Within one week after I had reported the above case to the Washington Obstetrical and Gynecological Society a second case came under my care where the diagnosis of "chronic intussusception" was confirmed by operation.



Case II. Shaded portion shows extent of invagination.

CASE II.—Mrs. F., seen in consultation with Dr. W. S. Bowen and Dr. H. Kaufman in March, 1906. Her history was as follows: She was healthy and strong until 1902, with the exception of some abdominal discomfort following a fall from a bicycle in 1898. Her present illness began in 1902 with an attack which, according to her memory, presented the following features: violent pain beginning in the region of the cecum and radiating over the abdomen, distention, intense vomiting, and diarrhea. The attack was pronounced appendicitis. She does not think that she vomited bloody material or that she passed any blood in the stools. The attacks have recurred at short intervals (almost every week) since the first one in 1902. They begin with violent, colicky pain in the region of the cecum and radiate

over the abdomen, and are accompanied by distention, vomiting, and diarrhea. The diarrhea persists between attacks of pain and she has to take medicine continually to control it. It is much worse during the attacks of pain. She has lost between 30 and 40 pounds in weight, and suffers with headaches. Her appetite is variable. She married two years ago, and has borne a child in spite of her miserable condition. During the pregnancy and at other times several physicians have noticed a mass in the region of the vermiform appendix, and advised an operation for its relief. She has also been treated with irrigations of the colon for weeks without benefit. It has been suggested that the tumor mass was an appendical abscess, a floating kidney, and an ovarian tumor. When seen by me she was emaciated and weak but able to walk around. The examination showed the abdomen to be flat, with very thin abdominal walls which allowed the abdominal organs to be easily palpated. Extending across the abdomen just below the umbilicus was the transverse colon, which felt much thickened and quite tender to pressure. The descending colon could not be palpated. Following the thickened gut from its end near the spleen one could distinctly palpate this portion of the intestine and follow it to the cecum, where it ended in a tumor mass. This mass was the size of a small kidney, was firm to pressure, very tender, slightly tympanitic, and freely movable. It could be pushed into the pelvis, across the median plane of the body, and into the region of the right kidney. The tumor was first noticed two years ago, and is the spot from which the pain begins. The mass was plainly a tumor of the cecum. The right kidney was palpable in its proper place and the right ovary and tube could be distinctly felt, separate from the mass. Her temperature was 100° F., pulse 108. The examination of the heart and lungs was negative, and the vaginal examination showed the uterus, tubes, and ovaries to be normal. The rectum when viewed through the proctoscope showed the mucous membrane to be thickened and chronically inflamed. I did not see her in an attack of pain.

The diagnosis was probable chronic intussusception, with a possible new growth of the cecum, or tuberculous colitis.

Operation (March 19, 1906). A median incision 10-12 cm. long was made, with its center at the umbilicus. The abdominal organs were found to be apparently normal with the exception

of the intestines. There was found to be an invagination of the head of the cecum and a portion of the ileum into the ascending colon. The vermiform appendix was not to be found and undoubtedly had also been invaginated with the cecum. A few old adhesions of omentum were found at the thickened and wrinkled cecal end of the ascending colon, and the tumor felt here was apparently made up of the invaginated cecum and ileum. The longitudinal band of fibers instead of ending at the appendix turned into the lower thickened portion of the colon. The ileum could be seen to be distinctly invaginated. The ascending colon was shorter and of larger caliber than normal, and the transverse colon was situated abnormally low, its upper border being slightly below the level of the umbilicus. One could distinctly feel the invaginated gut, which ended abruptly about four inches from the splenic flexure of the colon. The peritoneal surfaces of the invaginated gut were so densely adherent that it was impossible to separate them without extensive dissection, so the intussusception was not disturbed.

A lateral anastomosis was made between the ileum, about six inches from its lower end, and the transverse colon, two inches below the end of the invaginated intestine. Connell's suture of catgut reinforced by a running fine silk suture to adapt the peritoneal surfaces was used. A small drainage tube was placed below the anastomosis, and a small gauze wick to the point of anastomosis was also used. The anastomosis was anti-peristaltic. This was deemed necessary, as otherwise there was considerable danger of ileus from twisting the loop of the bowel.

The advisability of resecting the invaginated gut, and also of attempting to reduce the invagination by slitting up the intussusciens was considered, but both were discarded owing partly to the weakened condition of the patient.

Her convalescence was perfectly satisfactory. The diarrhea disappeared immediately after operation and she had no more attacks of pain or vomiting. She is now (June 9) in excellent health and has gained 10 to 15 pounds in weight. The tumor mass in the cecal region can still be felt, but is considerably smaller and much less tender than it was before the operation. The ascending and transverse colon can be palpated but are not tender, and their thickening is not so great as formerly.

LARGE GELATINOUS TUMOR OF THE OVARY.

BY

A. LAPHORN SMITH, M.D.,

Montreal, Canada.

Surgeon-in-Chief of the Samaritan Hospital; Gynecologist to the Western Hospital
and the Montreal Dispensary, etc.

MRS. F., age 54, widow for seven years, was sent to me by Dr. Lamoureux, on May 11, 1906, complaining of a large abdominal tumor, which she had first noticed about a year before. She began to menstruate at 11; was married at 22; had 11 children, the last one fifteen years ago; no miscarriages; menopause at 47. Nearly all her labors were instrumental, as she had a small pelvis and her babies were large.

Examination: The uterus, bladder and part of the rectum were outside of the body, being a bad case of procidentia. As is usual in such cases the cervix had been badly lacerated, setting up subinvolution, retroversion and prolapse. The cervix was elongated so that the sound entered nearly six inches. There was an ulceration of the vagina occupying about three square inches, due to bruising and sticking to the clothing. It is possible that the procidentia was aggravated by the size of the tumor pushing the uterus out, but I do not think so, the previous explanation being more probable. The abdomen was distended to double the size of a full-time pregnancy by an ovarian cyst, which did not, however, give the usual wave on percussion. The tumor interfered with her breathing so much that for the last six months she says that she has not been able to lie down at night at all. Her abdominal wall, and indeed her whole body, was very much emaciated, although her pulse was fairly good. She entered the Samaritan Hospital immediately, and next day I introduced a very small trocar, with the hope that I might be able to draw off, very slowly, several gallons of liquid. I invariably resort to this plan when I meet with a large ovarian cyst or any tumor with ascites, so as to diminish the danger of shock from hemorrhage into the large abdominal veins, which is a well-known cause of death on the operating table. In this case nothing came out, from which I judged that the contents were semi-solid. Next day

a three-inch abdominal incision was made and a trocar as large as my finger was introduced into the tumor but with no result, so that it was necessary to continue the incision up to the ensiform cartilage and down to the pubes. The tumor was then found to be adherent to the entire abdominal wall in front, but it was easily separated by the hand. The tumor was then delivered with some difficulty and the large pedicle was clamped and severed. The ovarian and uterine arteries were felt for and tied separately, and then the pedicle, which was four inches wide, was hemmed so as not to leave any raw surfaces for the intestine to adhere to. About a quart of free jelly was then removed from the abdominal cavity, but whether this had come out of the small trocar hole during the twenty-four hours which had elapsed before the operation, or whether it came from a rupture of the cyst wall at the back, I am unable to say. It appeared as though it had been there for a long time. The jelly was scooped out as much as possible and the long incision closed with two layers of chromicized catgut, to within three inches of the pubes, when the needle was laid down and the incision covered with a sterilized towel and the patient rapidly placed in the lithotomy position. After thorough scrubbing, three inches of the cervix was removed without sacrificing any of the vagina, the edge of the latter being sewed to the cervical canal. The patient was replaced in the Trendelenberg posture and ventrofixation was performed, the uterus being attached as high up on the abdomen as the vagina would let it come. Then the rest of the abdominal incision was closed. She made a rapid recovery; was up in twenty-one days and went home in twenty-eight.

The contents of the cyst were not like the ordinary colloidal viscous material, but were more like the jelly one buys at a caterer's. It was exactly the same as what I showed at the Medical Society of Montreal and reported in the *AMERICAN JOURNAL OF OBSTETRICS* several years ago as having been removed, to the amount of several gallons, from the abdomen of a patient from Vermont, and which seemed due to that rare disease, gelatinous disease of the peritoneum. That is a condition on the borderland of cancer, because once the peritoneum has been infected with it, the abdominal cavity can go on manufacturing jelly indefinitely. I heard from the Massachusetts General Hospital three years later

that that patient was in there with the abdomen as full of jelly as before. It will be interesting to follow up the present case, as can be done, as she is a resident of this city. Tumors as large as this are quite rare now, because so many are on the lookout for them and remove them while yet small.

TRANSACTIONS OF THE WOMAN'S HOSPITAL SOCIETY.

Meeting of April 24, 1906.

The President, DR. MALLETT, in the Chair.

DR. BISSELL.—A pathological report is to be made this evening by Dr. Jessup of a case I reported to the Society some time ago. The case was one of double pyosalpinx and appendicitis in which I found the intestines matted together about what appeared to be an ovarian cyst. There was, however, no connection between the ovary and the cyst. It was apparently free in the abdominal cavity except for adhesions to the intestines. Besides the cyst a double pyosalpinx was present.

DR. JESSUP.—Examined microscopically, the appendix showed a mild grade of chronic inflammation, but there was no connection between it and the cyst wall. The lining did not show any epithelium, as this had been destroyed by the pressure in the cyst. The cyst was evidently not one of the ovary or of the appendix, and I came to the conclusion that it was such a cyst as is sometimes found in the peritoneum or in the mesentery derived from the serous coat of the latter.

DR. WEST presented a specimen of

RUPTURED PREGNANT BICORNUATE UTERUS.

This came from a woman about 33 years old. I had seen her about two years before and had made a diagnosis of small fibroid tumor of the uterus, and from the situation of it I had recommended an operation. She became pregnant about eighteen months ago and went five months. About five weeks ago I was called up at three o'clock in the morning and found the patient moribund. I made a diagnosis of intraabdominal hemorrhage and rupture of the uterus. She gave a history of having skipped four periods. The rupture of the uterus occurred while she was washing her face just prior to going to bed, when the other physician was called. He gave her strychnine and other stimulants and she sent for me. I operated upon her right there in bed. Before operating, with the aid of a medicine dropper and a fountain syringe the transfusion of three pints of

water was done. The patient responded to this very nicely. On opening the abdomen the blood gushed out and the fetus presented itself at the opening. The placenta was still partly *in situ*. The uterus was bicornuate, the tube apparently normal. The patient rallied and regained consciousness but did not recover.

DR. JESSUP.—A good deal of the tube is here for the specimen to be a pregnancy of the interstitial type. It appears to be one of bicornuate uterus.

DR. GRAD read a paper entitled

BLADDER AFFECTIONS IN GYNECOLOGICAL CASES.*

DR. BALDWIN.—We hear a great deal about the uterus pressing on the bladder, but as a rule, that is not a cause of bladder symptoms. As a rule, I think, irrigations in the acute stages have aggravated conditions rather than relieved them. I have never gotten any good from urotropin. In the ordinary cases of cystitis pure sandalwood oil will almost invariably give relief.

DR. BISSELL.—Dr. Grad did not refer to bladder disturbances following acute retroversion of the uterus. I think it is one of the prominent symptoms of acute retroversion. Sims, in the beginning of his study, was called in consultation to see a woman who was thrown from a horse. In that case the bladder symptoms were the most prominent. I have had one case in particular where for fourteen years the inability to retain urine persisted until the uterus was replaced, and since then she has had no especial trouble in that direction. In the treatment of cystitis I am using argyrol with good results.

DR. JANVRIN.—Every once in a while I have met with cases of marked cystitis and have treated them with the methods generally used in former years, washing out with saline solution and then applying something stronger, generally a mild solution of nitrate of silver. I have come to the conclusion, especially within the last three or four years, that as a rule the less manipulation and the less washing out we do, after it has been done a few times thoroughly, the better. If there is present a small amount of pus, and the urine is acid, as it ordinarily is, I use a few washings out with a moderate solution of boracic acid. Then letting the bladder rest a few days I inject a mild solution of nitrate of silver, one to four thousand. I inject a couple of ounces of it and let that pass out through the catheter. I then in a few moments inject another two ounces, allowing the patient to retain that, perhaps a minute, and then get up and pass it herself. I am getting better results with that method of treatment than by any other means. I have one case now under treatment following confinement in the early part of February. Her first child was born three years ago, an instrumental delivery

*See original article, page 374.

at which I was in attendance. She had a much larger child this time and I was absolutely unable to deliver the child with forceps. It was a face presentation, with a very large head. I kept the patient under chloroform and succeeded in delivering a dead child after a good deal of hard work. The patient passed urine normally for four or five days after labor, when it became necessary to use a catheter. In about another week she developed a cystitis. I gave her helmital internally at once. A week later I changed to urotropin, giving also proper tonics. After about two weeks I washed out the bladder with a rather mild solution of boracic acid, and then resorted to the use of nitrate of silver in the strength before mentioned, and used that every third day for six times. I find a specimen of the urine to-day is absolutely free from pus, and she is apparently well, although she still has a little frequency in passing urine during the day, but she goes through the night absolutely free from any discomfort in that respect. I hope the case is cured. I have found the mild solution of nitrate of silver a very thorough remedy in cases that have not been going on for more than a month or six weeks. I would like to ask Dr. Bissell what the strength of the argyrol is which he uses.

DR. BISSELL.—A 30-per cent. aqueous solution is used. After catheterizing the bladder I inject the solution with the ordinary glass syringe directly into the bladder and allow the patient to retain it for an hour or more. I do not give any irrigation.

DR. WEST.—I have been rather surprised at the few cases of really bad cystitis that have been mentioned which the methods described will not relieve. The only thing that I have been able to do to relieve such cases has been to secure drainage by making an ordinary vesicovaginal fistula. I have such a patient now whom I treated absolutely in vain until this was done. She got immediate relief from the drainage. The danger in such treatment is contraction of the bladder.

I have recently used the Tilden Brown cystoscope with the electric light. With that we examine the patient best in the dorsal position. About four ounces of boric acid solution is put in the bladder to distend it for examination. In one of our cases we catheterized both the ureters of a patient in forty seconds with this instrument.

DR. BISSELL.—Argyrol is disagreeable to use and will leave a yellow stain on the clothing, which can be removed with bichloride of mercury, 1 to 1,000.

DR. GRAD.—I fully agree with Dr. Baldwin that in the very acute cases irrigation is not desirable. It is in those acute cases that I found adrenalin of great use. By causing a reduction of the congestion in the bladder the cases will respond very much better to other therapeutic measures. I agree with Dr. Janvrin that too much irrigation is not desirable, and yet in bladders that have retention and a deposit of urine sediment it is very

necessary. There are some cases that nothing but drainage will cure, cases with thickening of tissue or actual destruction of the mucous membrane. I have used urotropin in these cases without any ill effect, and in a great many cases with a very good result. About the kidney cases, concerning which Dr. Cleveland inquired, I can only say that very recently I had a case of puerperal sepsis where an additional infection had taken place in the kidney. Considerable pus appeared in the urine. I think probably there was an infarction. The use of urotropin gave great relief. Even with the greatest care, with absolute aseptic technique, we are apt to get cystitis after catheterization, germs being carried into the bladder from the urethra. Dr. Mallett mentioned those cases that have dribbling of the urine. I think this is caused by a tear in the sphincter of the bladder. The sphincter action in these cases is very poor; sneezing or coughing allows some urine to escape.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of March 16, 1906.

DR. SHANDS reported a case of osteomyelitis in a child.

DR. BALLOCH said that in many of these cases where so much bone was destroyed new bone was not formed. Dr. Shands' case showed a very rapid reproduction of bone.

DR. SHANDS said that deformity at times resulted from such conditions and something might have to be done later in this case. In one case where the tibia was markedly involved, a bowleg resulted, due to the growth of the fibula.

DR. MILLER read the essay of the evening,

INTUSSUSCEPTION.*

DR. VAUGHAN said that the symptoms described by the writer, with the escape of the vermiform appendix, made the diagnosis fairly certain. How else could the appendix have gained entrance into the cecum? The appendix might slough and the resulting abscess empty into the bowel and the appendix be discharged in this way. The symptoms would, however, in such a case be different from those described. The case was probably one of the ileocecal variety with the appendix, cecum, and ileum invaginated. He had seen a case of double invagination. The phlebitis in the leg was an interesting feature, but one not uncommon with inflammatory processes in the abdom-

* See original article, page 390.

inal cavity. Phlebitis was nearly always due to an infection, and there was probably an infection in this case.

DR. FREMONT-SMITH said the case recalled to him a case seen in consultation. A child 6 months of age had been ill 24 hours with vomiting, diarrhea with bloody stools, and rigid abdomen. It was impossible to make out a tumor before anesthetization. After consultation with Dr. Shober it was decided that the case was one of intussusception, and an operation was performed. At operation no tumor was discovered and it was thought that the intussusception had been spontaneously reduced. The autopsy revealed an ileocecal invagination which had not been relieved. The case showed how difficult it was in some cases to make a diagnosis and even after opening the abdomen the intussusception might not be discovered.

DR. STONE differed with the essayist regarding the diagnosis. When he first saw the case the question uppermost in consideration was the propriety of operation. The condition of the patient and the symptoms were such that he advised against operation.

In explanation of the symptoms he recalled a case of dermoid cyst with a twisted pedicle in which the tumor had attached itself to the colon and discharged into it. The characteristic signs of intussusception were absent in the case reported by the essayist, there being no intestinal obstruction, no marked distention, no blood nor mucus. There was usually more pain and shock, and all cases that he had seen had died.

DR. ABBE had seen 6 or 7 cases, mostly in infants. In three or four of them a tumor could be felt before operation. The tumor in the majority of the cases was in the left side of the abdomen above the umbilicus. In one case there was marked cyanosis which grew better and recurred. One case was in an adult and was chronic. At the onset there were acute pain, vomiting, and diarrhea.

The condition had existed three months when operation was done. It proved to be an ileocolic intussusception with an invagination of the cecum, appendix, and ileum. Adhesions had taken place and it was impossible to reduce it. A longitudinal incision was made in the intussusciens, and the intussusceptum, which was partially gangrenous, was removed and an anastomosis was done. In another case, an infant, the condition was reduced by operation and the second day the symptoms recurred. An injection was given and the symptoms ceased. It was probably a recurrence of the condition which was cured by the irrigation. It seemed to him that the case reported by the essayist was not proven. It might have been a gangrenous appendix discharged through an abscess which had opened into the colon.

DR. WHITE said the etiology of intussusception was inter-

esting, especially in view of the work recently done on intestinal peristalsis. It had been definitely shown that reversed peristalsis occurred. Cats fed upon bismuth and observed by x -ray showed the reversed peristalsis. Auscultation over the small intestine showed a regular sound every seven or eight seconds. The same thing occurred in the large intestine, only at not so short intervals. By means of a transmitter and electrode a tracing representing normal peristalsis might be made. Abnormalities of peristalsis could probably be shown and might be significant in intestinal troubles.

DR. BALLOCH said that the diagnosis of the case reported would always remain in doubt. Several things could be ruled out, such as a solid tumor, thrombosis of a mesenteric vessel, kidney, etc. The diagnosis seemed to hang upon the nature of the tissue discharged from the bowel. Pain and intestinal obstruction were not necessarily symptoms of intussusception. He operated upon a case where there was no pain, and obstruction was not a constant symptom. The presence of a tumor in the left side was the strongest argument against intussusception. If the lumen of the intestine remained open or partially so there would be no marked distention. It might have been a hernia through a slit in the mesentery which did not totally obstruct.

DR. ADAMS said he had seen a number of cases of intussusception. There was frequently in infants very little evidence of pain other than straining. There was expulsion of blood and mucus, not always accompanied by distention. He had a case where there were two distinct intussusceptions. The invaginated gut could be felt by a finger in the rectum. A saline enema caused reduction. The same condition recurred in a month. These cases were apt to run in groups. He was inclined to believe that in intestinal diseases in children there was often a condition resembling intussusception. In most of his cases the tumor was in the splenic region. In a case of Dr. Ford Thompson's, where the whole cecum and appendix protruded from the anus, the child recovered. In making a diagnosis in children, paroxysmal attacks of straining, with mucus and blood in stools, were the most important symptoms. At times a tumor could be found; at others none could be discovered.

DR. VAUGHAN said he had heard a very interesting paper by Dr. M. Richardson in which he recounted a case of a boy in which the intussusception could not be reduced at operation; an artificial anus was made, followed by death. Autopsy showed that the invagination had been spontaneously reduced.

DR. STONE remembered a case of Dr. Gayle of Roanoke, Va., in which he stood the patient on his head and gave large enemata under chloroform with reduction of the intussusception.

DR. MORGAN saw a case with Dr. C. G. Stone of this city. The patient was a stout woman with all the typical symptoms.

High rectal enemata were given and she apparently recovered. She took a dinner of ham in 48 hours; the trouble recurred and she died.

DR. MILLER said that the tissue was undoubtedly an appendix, which with the symptoms made the diagnosis practically certain.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Resistance of the Spores of the Anthrax Bacillus and Their Passage from the Mother to the Fetus.—Santi Sirena (*Arch. per le Sci. Med.*, Vol. XXX, N. 8) has shown that spores of anthrax that have been dried by concentrated sulphuric acid, chloride of calcium, high temperature or exposure to sun, live for various periods. They are killed in nineteen days by the free air and hot sun. When dried in the presence of moisture they live 490 days. Dried by sulphuric acid they live for 436 days; dried in the thermostat, for 406 days. Thus solar light is the best destroyer. Creolin up to the strength of 60 per cent. does not destroy the spores; pure, it kills them after twenty-four hours. In ten-per-cent. solution it kills bacilli in fresh blood in ten minutes, and after twenty minutes those in the spleen of a diseased animal. In distilled or sterilized water the spores maintain their vitality for more than two years; in unsterilized water they live three months and twenty-four days; in sterilized garden earth they live more than sixteen months; in the cadaver more than a year. The bacillus of anthrax has been shown in pregnant rabbits to pass into the amniotic fluid and to the fetus itself. Alterations are produced by the bacillus in the uterus itself, consisting of hyperemia, dilatation of the vessels, extravasations of blood, and infiltration. All these changes were found in the chorion and the muscular layer of the uterus. The placenta also contained the bacillus in great numbers in the veins of the serotina and the intervillous spaces. There were extravasations in the serotina. There were necrobiosis of the epithelium of the decidua, arteritis and phlebitis. The bacilli have been shown to pass from the mother to the fetus by way of the maternal and fetal placental vessels.

Anemia in Pregnancy.—Frederic E. Soudern (*Bull. Lying-In Hosp.*, June) believes that secondary anemia is the common type encountered in pregnancy. The records of the Lying-In Hospital show that there is moderate decrease in the number of red corpuscles from 500,000 to 750,000, and a reduction in the hemoglobin of about 10 or 15 per cent., which changes occur early in pregnancy and gradually disappear during the last two months of gestation. The exceptional feature in these cases is that instead of the leukopenia and relative lymphocytosis common

in secondary anemia, these cases present a moderate leukocytosis and relative increase in polynuclear cells. While this secondary anemia must be looked upon as a physiological change, its manifestation in greater degree, particularly when associated with leukopenia and relative lymphocytosis is certainly abnormal and for a number of reasons deserving of more attention on the part of the obstetrician.

Etiology of Eclampsia.—W. Leipmann (*Zent. f. Gyn.*, June 16, 1906) says that puerperal eclampsia is an autointoxication which results from a toxin found in the albumin molecule, and separated in the placenta through faulty action of the syncytium on the albuminous bodies of the mother's blood. Normally these poisons are neutralized by antitoxic substances. When this neutralization does not take place poisoning results. The liver and kidneys protect the system against this poisoning, hence the prominent symptoms are those of a disease of the kidneys. The liver should retain these toxic albumins. In some cases only a small amount of poison is produced and this is retained by the liver, hence there are no convulsions. In other cases much poison is produced; a portion is retained by the liver while another portion causes convulsions during labor. When enough of the poison is retained there are no attacks until after labor has passed, and then the abstraction of blood at labor, the formation of the milk secretion, etc., act as protecting factors. When the system is susceptible, from anemia or any other condition, the poisoning takes place more easily, and albuminuria and convulsions occur. This theory makes the therapeutics easy. For the kidney parenchyma the writer uses saline infusions and diuretics; for the heart, caffeine and camphor; for the coma and convulsions, artificial respiration, and as few narcotics as possible, chloral hydrate being the best. Rapid delivery is to be accomplished.

Lumbar Puncture in Eclampsia.—J. Thies (*Zent. f. Gyn.*, June 9, 1906) states that there are marked changes in the central nervous system in eclampsia. In 59 per cent. of the ninety-nine cases reported by Pollack there was edema of the brain in acute or chronic form at the autopsy. Extravasations into the brain are frequent. There is greatly increased pressure of the cerebrospinal fluid in many cases. The author made lumbar punctures in seventeen cases observed by him. In fourteen of these there was no doubt of the eclamptic nature of the case. Saline infusion and rapid delivery were made use of, but when the attacks still continued a lumbar puncture was made to lower the blood pressure. The fluid from the puncture was clear except on one case, in which it was bloody, and this ended in death from brain hemorrhage. In all cases the pressure of the cerebrospinal fluid was increased. In some it was as high as 600 mm., and in such cases death ensued. In those

in which it was under 200 mm. the prognosis was better. Prognosis depends on temperature, respiration, coma, number of convulsions, secretion of urine, and time of the beginning of convulsions. The puncture had little effect on the coma; the temperature was lowered after it; there was no marked effect on the continuance of convulsions nor on the secretion of urine. The mortality was seven out of fifteen cases treated. The conclusion arrived at is that the results of lumbar puncture are not at all uniform and not very encouraging.

Phlegmonous Gangrene of the Vulva in Pregnancy.—Lajos Goth (*Zent. f. Gyn.*, May 5, 1906) details a rare case of phlegmonous gangrene of the vulva which occurred in a young primipara during pregnancy without interrupting the pregnancy. Two weeks before her entrance to the hospital she fell and struck her heel against the vulva with great force. Three days after the injury the vulva began to swell and the labia to become very red. The lower two-thirds of the right labium formed a gangrenous sac, while the inner surface of the left labium became ulcerated. The inguinal glands of both sides were swollen. The swelling became gangrenous over both labia. Under narcosis the gangrenous portions were removed, the base cauterized and a catheter tied into the bladder to prevent the urine from irritating the surface of the wound. There had been no rise of temperature. The wound granulated normally, and healed, leaving little deficiency of tissue. The pregnancy went on to term. In similar cases various germs have been found in the tissues to account for the infection, such as staphylococcus, proteus vulgaris, spirilla, etc. In this case neither bacteria nor spirilla were found, but simple cocci in short chains. There was true infiltration and necrosis, and the author classes it as a true gangrenous phlegmon of the vulva. The author cannot find any such case described in literature. Another point of interest is the absence of fever with so severe infection, while a third is the failure to interrupt the pregnancy.

Pyelonephritis of Pregnancy.—Georg Zickel (*Monatsschr. f. Geb. u. Gyn.*, June, 1906) says that the diagnostic signs of pyelonephritis in the pregnant state have been given as pain over the kidney, difficulty of urination, typical fever curve with morning remissions, slow pulse with high fever. The author records a case in which these symptoms were far from being typical and the diagnosis of septic uterine poisoning might easily have been made, had not a careful examination of the urine shown pus cells and casts with an acid urine. Shortly before labor the urine had been found to be normal. There was a dachryocystitis, in the discharge from which were staphylococci and streptococci, and it is possible that the genitals were inoculated by the patient from this source. The day before labor the patient was attacked with symptoms of a septic nature, pyemic fever and chills without any local symptoms in uterus or bladder. Had not the

fever begun before the labor we should have been justified in suspecting puerperal fever. The urinary examination showed albumin, casts, pus cells and kidney epithelium. The right kidney was swollen and dislocated downward. In the urine were found staphylococci and small diplococci. Four and a-half weeks before labor there were pains so strong that premature labor was expected, but the labor did take place before the nine months were up. This is said to be one of the symptoms of pyelonephritis in pregnancy. A routine examination of the urine will aid in the diagnosis in such cases. The treatment applicable to septic puerperal poisoning would not be appropriate in such a case; alcohol, saline infusion, etc., would only do harm when the kidneys were affected.

Gonorrhea and Labor.—Aug. Mayer (*Monatsschr. f. Geb. u. Gyn.*, June, 1906) sums up the symptoms characteristic of the puerperal state when the patient is affected with gonorrhea thus: Puerperal gonorrhea is not at all without danger. There may result high fever and a severe general infection with chills so as to give the clinical picture of a septic condition. How this action of the toxins of the gonococcus affects the system is as yet unknown. No streptococci or staphylococci are found in such cases. Remissions or intermissions of the high temperature are not always present. Late fever is not altogether characteristic of this condition. The children born to the six mothers on whose cases these observations are based were all very weak and two succumbed during the first week of life. It is possible that there were gonorrheal changes in the placenta which caused this weakness by poisoning from toxins due to gonococci.

Prolapse of the Uterus in Pregnancy.—Henry R. Andrews (*Clin. Jour.* July 18) observes that women with severe degrees of prolapse, that is where the whole or a large part of the uterus is outside the vulva, are less likely to conceive than when the cervix lies within the vagina, but pregnancy occasionally occurs in the former. Hypertrophy of the cervix affecting the vaginal portion of the cervix may resemble or be accompanied by prolapse. In these cases pregnancy causes increased swelling of the enlarged cervix, and if the vaginal orifice is small the part of the cervix outside the vulva may be so much swollen that it cannot be pulled up. In these cases unless the supra-vaginal portion of the cervix becomes greatly stretched and elongated the body of the uterus will be unable to rise up out of the pelvis. An acute onset of prolapse may occur during the early months of pregnancy from a violent strain or fall. The symptoms due to the prolapse are usually intensified during the early months of pregnancy, but after the fundus has risen up above the pelvic brim the symptoms cease. If the cervix remains outside the vulva it becomes deeply congested and is likely to become ulcerated and bleed. If the body of the uterus

remains in the pelvis, either because it is retroverted and incarcerated under the sacral promontory after acute prolapse or because it is held down by the swollen cervix, pressure symptoms will occur, and if not relieved abortion will follow. These cases, when seen in the early months of pregnancy, must have the uterus pushed up and a soft ring pessary inserted. Care must be taken to see that the fundus is pushed up and not allowed to go down into Douglas' pouch. The ring should be removed at the end of the fourth month. If there is much vaginal discharge a douche of liquor plumbi subacetatis should be employed. When the ring cannot be retained a cup and stem pessary should be used. When the stem pessary causes pain and bleeding a pessary consisting of a hollow ball a little smaller than a tennis ball mounted on a stem can be employed, the ball to be inflated after insertion. The dangers of prolapse in labor are dystocia due to the hypertrophied cervix, rupture of the lower uterine segment and sepsis.

Cesarean Section.—J. W. Markoe and Asa Davis (*Bull. Lying-In Hosp.*, June) report a series of forty-one Cesarean sections. Of these cases six of the mothers died. Three were septic before operation, one died from acute exacerbation during labor of a chronic parenchymatous nephritis, one from shock of hysterectomy added to Cesarean section, and one from peritonitis. Of twenty cases reported by J. W. Markoe one child was still born, and died at birth of atelectasis, two died in two days of atelectasis, one died in two months of marasmus; fifteen survived. Of twenty-one cases reported by Asa B. Davis, one child, moderately hydrocephalic, died; one child died in two days from inanition; one was premature, and two others died shortly after birth; all the other children survived.

Hebotomy.—Arthur H. Bill (*Surg. Gyn. and Obst.*, July) mentions among the advantages of this operation over Cesarean section the following: (1) The peritoneal cavity is not opened and the genital tract is not involved. (2) The greater simplicity. (3) It does not interfere with future labors. Among the complications may be mentioned hematoma of the labia and at the site of the operation, lacerations of the vaginal wall, injury to the bladder and thrombosis of the veins of the legs. The writer believes this operation could advantageously be combined with the induction of premature labor. Immediate delivery by hebotomy should be advocated.

Thirty Embryotomies in Private Practice; Statistics of 1655 Published Cases.—L. Ronsse (*Bull. de la Soc. Belge de Gyn.*, Vol. XVI, No. 4) combats the dictum of Pinard that we should never perform embryotomy on the living child. He believes that this operation has a recognized place in obstetrics. If we could always get our cases of contracted pelvis in an early stage of labor, uninfected by frequent examinations and attempts at delivery, without fever and in good general condition, we might

always perform Cesarean section or symphyseotomy. But such conditions rarely obtain in private practice, and often the case has been brought to a condition in which such operations would almost necessarily be fatal, before the practitioner reaches them. In such cases, when the child is already exhausted by the long labor and the attempts at delivery, and perhaps injured by them, one should destroy its life rather than submit the mother to an operation that is very likely to be fatal to her, in order to try to save the life of a child that very likely will live but a little while. A basiotripsy well conducted under aseptic conditions presents no danger at all to the mother, far less than either Cesarean section or symphyseotomy. During six years the author has practiced thirty embryotomies, in city and country. Of these he gives the histories and states that in all that recovered, twenty-seven in number, the puerperium was physiological in all respects. Eighteen cases were primiparæ, twelve multiparæ. Thirteen cases were of contracted pelvis, none having a diameter of more than 9 cm. Three cases died, but in all of them the fetus was dead and in a state of decomposition when it was extracted. In twenty cases the child was dead when the author was sent for. In eight others it died during manipulations undertaken to deliver it alive. In nine cases the placenta was removed for adherence to the uterus. The statistics obtained from 1655 embryotomies that have been published by various authors are given. Out of these there are twenty-six in which death may fairly be attributed to the operation, that is a mortality of 1.57 per cent. Many of these cases have been infected before the operation. Done carefully under good conditions the operation is without danger to the mother. It is within the power of any general practitioner. With modern instruments it is easily done. Thus embryotomy should, in exceptional cases, still be performed on the living child.

Embryotomy on the Living Infant.—Pierre Budin (*L'Obstet.*, May, 1906) details a case in which embryotomy on the living infant was justified, the pelvis being absolutely flattened and the vagina having been torn by ineffectual efforts at extraction by forceps. The temperature was 38° C. and the condition of the patient serious. It was not advisable to perform Cesarean section or symphyseotomy on account of the already infected condition of the vagina. To save the mother's life that of the infant was sacrificed. The mother recovered. The question whether the physician should perform embryotomy in cases in which, with a living infant, to save its life a serious operation must be done on the mother under circumstances that render such an operation dangerous for her, may be answered without reserve in the affirmative. It is better to save the uterus of the mother and her child-bearing powers than to sacrifice them by a Cesarean section which must be followed by removal of the uterus, for the sake of a living child, which may die soon after

birth as a result of the manipulations attempted to deliver it. In another pregnancy the mother may by induction of premature labor produce a living child. We have no right legally to perform an operation on the mother without her consent, and this is often refused in such cases.

Criminal Abortion.—Schickele (*Münch. med. Woch.*, May 22, 1906) believes that the frequency of criminal abortion is increasing under the influence of the frequent demand for the breaking up of pregnancy and the lust for gold. High culture does not lessen the desire to escape the results of pregnancy, while the poor man feels that he cannot afford to have many children because he finds it so difficult to support them. Fortunately the great body of professional abortionists are not of the regular medical profession. Midwives and charlatans compose the most of this class. But the poor woman is in many cases her own operator. She practices what has been recommended by the midwife. The drugs formerly used and which often caused in a slow sepsis are now less employed, while mechanical means, the introduction of sounds, bougies, needles, or syringes into the uterus increase, fortunately with fewer deaths from sepsis. The author records many cases to show that the woman can introduce instruments into her own uterus successfully. That sepsis from unclean instruments is not more frequent is wonderful. It is often very difficult to tell whether the abortion has arisen spontaneously or has been induced. If the fetus is found injured this means that instruments have been used. Where there is much bleeding the abortion is induced. Spontaneous abortions are slow and bloodless as a rule. If there are fresh wounds of the genitals these are positive proof of the use of instruments. A sudden emptying of the amniotic fluid goes to show artificial means. The struggle against criminal abortion is of great importance to the state. Education of the masses is the only means of lessening its frequency. Cases in which it is necessary to produce an abortion to save the life of the mother are rare. The government should interfere to assist the young unmarried girl who becomes pregnant to bring forth and support her child; institutions for this purpose should be increased in numbers. Thus many children would be saved. The government should, perhaps, aid the poor man in supporting his numerous children. These are a few of the means that may be used to lessen the number of criminal abortions that take place.

Anesthesia in the First Stage of Labor.—Franklin S. Newell (*Surg. Gyn. and Obst.*, July), in comparing the use of scopolamine and morphine and ether for anesthesia in the first stage of labor finds that ether is more certain and less liable to be followed by uncomfortable after effects. Definite results are to be expected from the use of scopolamine and morphine in combination in the majority of patients, and patients who are not susceptible to its

effects do not seem to show any serious after-results, while the frequency of operative delivery does not seem to be increased by its use. The after-effects are slight, though the action of the uterus after labor is completed must be carefully observed, as relaxation with consequent hemorrhage is a distinct danger.

Transverse or Oblique Presentations.—S. J. Thomas (*Surg. Gyn. and Obst.*, July), when he discovers a transverse presentation during the latter weeks of pregnancy, applies a firm binder after he has altered the presentation to a vertex by external manipulation. This binder should be worn until labor begins. When seen early in labor with the membranes still intact and the fetus movable, the position should be changed by external version and if the os is considerably dilated the membranes should be ruptured in order to fix the presenting part. When the os is fully dilated bipolar or podalic version should be performed. When the membranes are ruptured the os must be dilated with a rubber bag or manually and version performed and the child delivered as soon as possible. With tetanic contractions and threatened rupture of the uterus, version is contraindicated. In rare cases, by pulling on the prolapsed arm it may be possible to deliver the child by evolution. With this exception, embryulcia or decapitation should be performed. When the neck cannot be reached evisceration or spondylotomy should be done. Cesarean section is indicated only in absolute pelvic contraction.

GYNECOLOGY AND ABDOMINAL SURGERY.

Sclerotic Changes in the Uterine Vessels in Nulliparæ and Multiparæ.—Kurt Wittek (*Monatsschr. f. Geb. u. Gyn.*, June, 1906) describes the anatomical findings in four cases of metrorrhagia at the menopause, and states that there seems to be a large percentage of such cases in which there could be demonstrated sclerosis of the uterine vessels. The cases described were operated on by total extirpation of the uterus on account of uncontrollable hemorrhage from the uterus. All cases in which there were myomata, or affections of the adnexa or heart troubles, were excluded from the material examined. Many authors have believed that a primary affection of the vessels of the uterus was responsible for these cases, there being an increase of elastic fibers in the uterus, and a degeneration of hyaline nature with replacement of the muscular tissue by connective tissue. This results in an inability of the uterus to contract, and consequent hemorrhage. In all these patients there was a congestion of the genital organs. Ergot had no effect on the bleeding unless to increase it. Owing to the degenerated condition of the arteries the ergot affected only the less degenerated veins and a venous stasis resulted. Hence in such cases ergot is contraindicated. In all four uteri there existed a primary degeneration of the intima of the vessels. The con-

nective tissue formation was secondary. It began with hypertrophy of the media, then of the intima, followed by degeneration of both, and connective tissue formation and calcareous deposits in all the coats of the arteries. There was increase of the elastic fibers in the vessel wall which would hold the vessels open and facilitate bleeding. As to the cause of the sclerosis there is in nulliparæ only the nervous irritability which often exists, which would cause vasomotor phenomena ending in sclerosis. In multiparæ it is certain that frequent pregnancies tend to bring about senile changes in the uterus. A mechanical factor enters into the causation, *i.e.*, the obliteration of the capillaries in the fundus and the opposite condition in the cervix. Here an increase of pressure would affect the remaining capillaries in the cervix and cause hemorrhage.

Uterine Fibroids Complicated with Cancer.—J. Bland-Sutton (*Four. Obst. and Gyn.*, July) finds that in a consecutive series of 500 cases of fibroids operated upon, 63 of the patients were between 50 and 73 years old. Among these sixty-three women there were eight cases of cancer of the corporeal endometrium. He cites these cases to show that the combination of fibroids and cancer is most likely to occur between the ages of 50 and 60, as in his series only one cancer case was over 60. When cancer of the body of the uterus occurs unassociated with fibroid it has a wider age range. It is possible that the presence of fibroids may influence the age-incidence of cancer of the endometrium.

Supravaginal and Panhysterectomy.—Frederick Edge (*Brit. Gyn. Jour.*, May) reports two deaths following supravaginal hysterectomy, one due to secondary hemorrhage from the left ovarian artery and the other to sepsis. He believes that life might have been saved in both cases had panhysterectomy with drainage been performed. In the former the hemorrhage would have been discovered earlier and in the latter the patient would have stood a good chance of recovery had free drainage been used. In deciding between the two operations he believes the question of sepsis will eventually have more weight than the possibility of malignant degeneration.

Chronic Infective Metritis.—Augustus W. Addinsell (*Four. Obst. and Gyn.*, July) applies the name chronic infective metritis to a class of cases which appear to be due to infection and run a course of three stages. The first stage is a round-celled infiltration; the second is intermuscular fibrosis; and the third and final stage is degeneration of this fibrous overgrowth. These three stages gradually merge into each other, but two of them may be present at the same time. The writer reports cases illustrating the three stages. These cases ran from 29 to 34 years of age, and none were multiparæ. They were characterized by intermenstrual hemorrhages, which were profuse in most cases and not amenable to local treatment. Drugs, curettage and local treatment should be given a fair trial, but if they fail to control the hemorrhage, hysterectomy must be performed.

Salpingitis and Parametritis in Nulliparæ.—Samuel Wyllis Bandler (*Med. Rec.*, June 9) observes that virulent gonorrhea in the female results from infection by an acute or recent gonorrhea in the male. The majority of pyosalpinges are to be attributed to this cause. Less virulent gonococci from old cases produce a subacute and scarcely recognized infection of the cervix. Reinfection, labor, abortion, pregnancy and curettings produce a recrudescence of the lesion, varying in severity according to the character of the original infection and in proportion to the resistance of the tissues. The majority of cases of chronic nonpurulent parametritis and salpingitis are due to the less virulent infection. Many cases of cystic ovaries, tuboovarian cysts, perioophoritis and peritoneal adhesions are due to this form of salpingitis, as are also numerous cases of pelvic pain, many cases of sterility and ectopic gestation. Milder degrees of salpingitis do not necessarily cause much pain or discomfort. Since the gonococci are in the cervix and uterus, conservative operations always include the possibility of subsequent further invasions of the structures left behind.

Ureteral Symptoms in Gynecological Cases.—In seventy-five per cent. of all multiparous women seen by Oscar T. Thomas (*Surg. Gyn. and Obst.*, July) who complained of the classic subjective symptoms of disease of the degenerative organs and in at least ninety per cent. of nulliparous women, the pain and tenderness during manipulation was located, not in the uterus, tubes or ovaries, but in the pelvic portion of the ureters. In treating these patients the ordinary hygienic, dietetic and hydrotherapeutic measures are quite essential. Support the abdominal viscera with a correct straight-front corset, giving to the form its natural shape. Give small quantities of salts or some mild aperient water daily and creosote in two-minim doses three or four times a day. Absolute rest during the menstrual period is needed.

Prophylactic Antisepsis.—Credé (*Münch. med. Woch.*, June 12, 1906) says that in the treatment of wounds and after operations it is not enough to maintain perfect asepsis; one should also protect the patient against possible infections by the use of prophylactic antisepsis. The substance par excellence for this purpose he considers to be collargol. He has for ten years made use of the mixed method of treatment in his 225 hospital beds, operating as aseptically as possible and then employing collargol in the disinfection and cleansing of the wound and in dressing it. He recommends this method as the best way of combating sepsis, and as the cheapest and most convenient treatment, being absolutely harmless and painless, so that there are no objections on the part of the patient to its use. In case of an accident with an infected wound which must be kept still in order to secure healing of a fracture, by the use of collargol one may be sure of preserving an absolutely aseptic wound, without the

necessity of frequent dressings or of moving the limb during manipulations. Absolute sterility with complete absence of reaction is preserved by the drug. The author believes that every wound should be treated by prophylactic antiseptics, for one never knows from what direction infection may come. After operations, no matter how aseptically they are conducted, the same method should be used. It gives an absolute feeling of safety, ease of handling and dressing, and painless and reactionless recovery. The drug is soluble and may be had in many forms: as powder, three parts of collargol to ninety-seven of milk sugar to be dusted into the wound; as solutions of various strengths for washing wounds; as leaves to be left in the wound to maintain sterility; as tablets for making solutions; as silver gauze for dressings. It may be used for syringing, gargling, eye-washes, internally in stomach wounds, by intravenous injection, as bougies in the bladder, urethra, uterus, fistulæ, etc., and for suppositories. The drug is exceedingly cheap and argyrosis from its use is unknown. Anyone who has impartially tried this antiseptic will be so well satisfied that he will never use any other.

Pulmonary Complications Following Abdominal Operations.—Hunter Robb and Howard Dittrick (*Surg. Gyn. and Obst.*, July) find that pulmonary complications usually originate in the following ways: (1) generally from an infection originating from the field of operation; (2) from the anesthetic, (a) from the administration of too great quantity of the drug, (b) from inspiration of vomited or infective material, (c) from an adulterated anesthetic; (3) from exposure either during or after operation. In a series of 1,007 abdominal operations, 35 developed pulmonary complications; of these, five died. Young and old patients were equally subject to these complications. In three of the above series acute pulmonary tuberculosis was evident immediately after operation.

Cholelithiasis.—In treating this condition William Bain (*Med. Press*, July 11) advises the patient to drink a pint of sulphur water before breakfast. During the day he gives a tablet of urotropin, gr. v, and of iridin, gr. i, taken with a glass of water to avoid bladder irritation. In addition to the above the diet and exercise must be carefully regulated. The writer believes that in recent gallstone diseases due to the typhoid bacillus urotropin is a specific. In old cases where the walls of the gall-bladder are largely changed into fibrous tissue nothing short of surgical interference is effective. Edmund A. Babler (*St. Louis Med. Rev.*, June 23) strongly advises operative intervention before the stones have left the gall-bladder. The mortality of operation is only 0.5 per cent. or about that of appendectomy.

Appendicitis.—The dangers of operating in an acute attack of appendicitis, according to Denis Kennedy (*Dubl. Jour. Med.*

Sci., June), have been greatly exaggerated, and with proper care are mostly imaginary. When suppuration is diagnosticated operation should not be delayed in the hope of adhesions being formed and pus becoming circumscribed. Children who have the disease usually have to be operated on for recovery. We should leave nothing to chance; consequently remove the appendix as early as possible.

Rectal Diverticulum.—Henry Jellett (*Brit. Gyn. Jour.*, May) reports the finding of a rectal diverticulum while operating upon a case of double salpingo-oophoritis. The diverticulum came from the pelvis colon and crossed the pelvis from right to left. It was two and a-half to three inches long and about a quarter of an inch in diameter. It possessed a lumen which apparently connected with the colon, and its walls were structurally continuous with the walls of the latter. The writer also reports a case of absence of the left appendages, which condition was discovered at operation. The patient had not been operated upon previously in such a manner that the tubes might have been removed. He believes the appendages were removed by absorption after some form of strangulation had deprived them of vitality.

DISEASES OF CHILDREN.

Articular and Extraarticular Suppurations in the Pseudo-Paralysis of New-born Syphilitics.—A. B. Marfan (*Rev. mens. des Mal. de l'Enfance*, May, 1906), says that most new-born syphilitics show evidences of syphilis from the time of birth in alterations of the long bones of the limbs, especially in the epiphyses. The osteochondritis may under treatment undergo cure without any symptoms being manifested. It may, on the other hand, go on to suppuration and extend to the surrounding tissues: it may perforate the periosteum and become parietal and infiltrate the muscles, or it may extend into the articular epiphyses: these suppurations may occur in all four limbs. Many authors believe that they are not due to syphilis alone, but that a mixed infection takes place. The author describes the case of an infant six weeks old who was unable to move any of the limbs on account of suppurative processes of all the large joints. There was complete pseudo-paralysis. The pus from these joints was entirely free from microbes. A rapid improvement took place under frictions with mercurial ointment and at the end of two months the child was entirely cured. There was no doubt of the diagnosis of hereditary syphilis. This case proves the origin of these suppurations from syphilis pure and uncomplicated. Such infections are curable, while in the case of those accompanied by septicemia

death always results. Children who are breast-fed have the best chance of cure.

Rickets as a Disease of the Race.—D. von Hanseemann (*Berl. klin. Woch.*, Feb. 26, 1906) calls attention to the social aspect of rachitis, inasmuch as it cripples its victims and unfits them for the business of life. The author thinks that this disease should be classed as an affection of the metabolism of the body, rather than, as is generally done, as a disease of the bones. There is present a disposition to lung troubles as well as intestinal catarrhs, a mild form of internal hydrocephalus, which causes spasm of the glottis and convulsions, and an external hydrocephalus which produces increased intracranial pressure on the medulla oblongata. The number of rachitic children who live to grow up is much lessened by the predisposition to infectious diseases of childhood which exists, and the liability to die from these affections. Tuberculosis of the glands as well as of the lungs kills many more such children. The results of the disease in later life vary much. In some cases the changes in the epiphyses cause the stature to be small. In others the opposite condition results, and giants are produced. Kyphoscoliosis is frequent and often results in death at about middle life, due to lack of aeration of the lungs from narrowed thorax. The rachitic pelvis in women is well known. Deformities of the legs are of two kinds, bowing out of the legs and knock-knee. The latter results in rachitic flat-foot, which reacts on the knock-knee and makes it worse. This difficulty prevents many men from entering military service. As to the etiology of rachitis there have been several theories. Against the infectious disease theory is the fact that it never occurs except in infancy, while all other infections occur in adults as well. Rachitis occurs in animals as well as in man, a fact which is of great importance in suggesting its etiology. Experiments have shown that it does not depend on an absence of lime salts in the food. Apes fed with plenty of lime salts still have rickets. Observations by those who have charge of zoological gardens go to show that animals in captivity have rickets, while those in freedom do not. The uncivilized races do not show any evidences of it. The Japanese, who live in houses that admit air, and dress loosely, do not suffer from it. It seems to exist in connection with conditions in which races are shut up in houses, wear constricting clothes, and do not exercise out of doors enough. This is, according to the author, the true etiology of the disease. In civilization the rachitic child grows up and propagates its kind, and its offspring have an increased tendency to rickets, so that we are continually increasing the liability of the race to the disease. We must fight against the disease by increasing the out-door life and exercise of the baby, at the same time nourishing it as well as possible, and we shall have to wait years before we can see the results of the treatment on the race.

Alteration of the Functions of Nutrition in the Nursing Infant.—G. Mya (*Riv. di Clin. Ped.*, May, 1906) does not confine his discussion of the alteration of functions of nutrition to the apparatus of digestion alone, because other organs, such as the liver and nervous system, are involved as well. The nursing infant is much more subject to general diseases than the adult. The pathology of infectious diseases in infants consists of three-quarters septicemias and one-quarter other infections. To the functions of the liver, biliary and glycogenic, is now added a new function, the protective against poisoning. Alkaloids introduced into the portal vein lose a part of their poisonous quality, while if introduced directly into the general circulation this power remains in full force. Substances of nutritive value undergo the same sort of change in the liver, so as to produce no poisoning of the kidneys when eliminated. This protective power in the infant is less than in older persons. The liver cells rapidly undergo degeneration under irritation of various toxins. There is an inability to reduce the toxic power of alimentary substances. Hence we must not limit our study to the disorders of the digestive tube, but enlarge our sphere to the diseases of the whole organism. We take up first the disturbances produced by alimentary causes, then those of infective origin, and lastly those the result of intrinsic causes. Of alimentary causes the author considers especially the use of cow's milk as a substitute for mother's milk, when obtained as far as possible without bacterial contamination. In some cases it is well borne, while in others it brings on disorders of digestion, nervous system, skin and circulation, general trophic disturbances, and finally death from marasmus. This fact is variously interpreted as resulting from excess of casein; from excess of fatty substances which become saponified and thus use up the alkalies of the body; as produced by an antagonism between the albuminoids of man and of the cow; as the result of changes in the milk due to sterilization, etc. Uncooked milk has several advantages: its fragrance makes it more palatable; the fats are finely emulsified; the phosphates and albumins are in easily assimilable form. The author believes that none of the causes alone will account for the failure of nutrition in such infants. Another factor that must be added is the rapidity with which the child takes the milk, allowing it to take too much. A child will stand too little nutrition better than he will the ingestion of too much food. The normal intestinal flora may be of value in helping digestion of artificial foods. Individual idiosyncrasy in the infant may aid in bringing about bad results. As to the treatment of these conditions: very little medicine should be given. The indications are to change the diet so as to make it agree with the patient.

Modified Dried Milk Feeding.—With a view to obtaining a milk which would remain sterile for use among the poor, D. Som-

merville and F. M. Harper (*Med. Press*, June 6) have tested, in fifty-five cases, desiccated milk modified by the addition of lactose, etc., and accompanied with directions for reconstitution of the milk and times of feeding. Twenty-seven children lived entirely upon the product for three months and all improved. Nausea and vomiting which had occurred while using cow's milk and barley water usually ceased within twenty-four hours. The stools improved rapidly in all cases. The change for the better was greater in cases previously fed on condensed milk. Where wasting occurred on breast milk the improvement was equally great and rapid. There would appear to be a place for this dried milk food among the poor where breast-feeding is impossible, and where clean and modified cow's milk is not to be had or disagrees.

Fats in the Feeding of Nursing Women and Its Effect in the Production of Fat in the Milk.—Engel and Plaut (*Münch. med. Woch.*, June 12, 1906) have made experiments on nursing women and on those not undergoing lactation to find out the effect of fats on the quality of the mother's milk when ingested with the food. It is well known that the fat of the food may pass into the milk. The author wished to ascertain whether by the use of certain fatty foods the quality of the mother's milk could be improved. It is well known to veterinary surgeons that the cream in cow's milk may be made richer by feeding with oil cake. Soon after a meal its effect may be noticed in the quality of the milk, and this influence continues for some time and gradually passes away. The question is whether the fat of the food goes directly to make up the butter of the milk, or whether this comes from the decomposition of a portion of the material already in the glands. On this depends the possibility of modifying the condition of the child by changing the diet of the mother. It has been demonstrated by one of the authors that there is no new production of fat in the breasts, but that preformed materials are made use of. To produce these there are only the fat of the body itself and that of the food. The daily meals of several attendants were estimated carefully as to their fat contents, then those of the nursing mothers, and by comparison it was ascertained that an increase of fat given to the mother improved the quality of the milk. They conclude that the amount of fat in the diet of a nursing woman should never be allowed to fall below a certain percentage, lest the quality of the milk become poorer, but that giving large amounts of fat is of no value in improving the milk.

Hydrocephalus.—J. S. Horsley (*Four. Amer. Med. Assn.*, July 7) reports a case of meningocele and hydrocephalus in a child four months old in which he excised the meningocele and then made two attempts to drain the hydrocephalus subcutaneously into the tissues of the neck along strands of chromic

catgut and of silk. These failed and he then instituted drainage through a small silver tube passed into a lateral ventricle. Symptoms of cerebral pressure did not recur while drainage into the aseptic dressing was free, but gastroenteritis, which had been present since before admission, increased and death occurred a week later. The writer believes that the method that appears to offer most hope in these cases is that of continuous direct drainage through some slightly antiseptic material, such as a malleable silver tube, followed, after the secretion of fluid has markedly diminished, by a permanent fistula between the ventricles and the subarachnoid space. After drainage has been carried out as long as necessary, the skull should be opened over the point of drainage, and by breaking up adhesions of the arachnoid around the fistula direct communication should be established between the ventricle and the subarachnoid space. The dura and scalp should be closed without drainage.

Meningitis in Infancy.—After an analysis of twenty cases of cerebrospinal and twenty of tuberculous meningitis, J. L. Morse (*Four. Amer. Med. Assn.*, June 23) says that the picture of meningitis in infancy is materially different from that of the affection in childhood and from that given in most text-books. The features most worthy of note are: the usual rapidity of the pulse and respiration; the infrequency and inconstancy of a slow pulse and respiration; the frequency of vomiting, both as an early and late symptom, and the infrequency of explosive vomiting; the infrequency of constipation; the infrequency of manifestations of pain; the relative infrequency of convulsions and of Kernig's sign; the variability of the knee jerk; the absence of ankle clonus; the absence of bulging or even the presence of depression of the fontanelle throughout the whole or a part of the course of the disease in certain cases; the almost constant absence of retraction and spasm of the abdominal muscles; and the frequent diminution or absence of increase in the spinal pressure as shown during lumbar puncture. The tubercular form has a more sudden onset and a shorter course than in later life. The symptomatology of the tubercular and cerebrospinal forms is essentially the same at this age, although the symptoms of spinal and, to a less extent, of cerebral irritation are, on the whole, more marked in the cerebrospinal. These differences, however, are insufficient to justify a differential diagnosis. The history or presence of a reasonable cause for the tuberculous form points strongly to this disease, but such evidence is frequently entirely wanting. A positive diagnosis between the two forms is impossible on the symptomatology and can only be made by an examination of the cerebrospinal fluid obtained in lumbar puncture. Lumbar puncture has no curative value in cerebrospinal meningitis, but is very useful for the relief of symptoms in both forms.

Therapeutic and Symptomatic Value of Lumbar Puncture in Tubercular Meningitis in Children.—Eugen Schlesinger (*Berl. klin. Woch.*, June 18, 1906) says that tubercular meningitis is the most hopeless disease by which a child can be attacked. There are to be found in literature the histories of twenty cases that have recovered, and these are probably cases in which the infection was not very virulent. There are four cases on record which recovered, in which the fluid removed by lumbar puncture was found to contain tubercle bacilli. The greatest danger is from the pressure of the increasing amount of fluid in the ventricles on the substance of the brain. The indication for treatment is to relieve this pressure, which may be done by lumbar puncture and the removal of fluid. The author has no cures to record, but he has seen temporary improvement as a result of removal of fluid. He also finds that one may prevent the occurrence of the convulsions which are so distressing to the parents, even if the child does not suffer from them. The patients live a long time in a state of unconsciousness, finally dying from edema of the lungs or sepsis. In infants convulsions are frequent, and they are relieved by puncture, and further convulsions are prevented. Puncture should be done early in the disease, and at least 50 c.c. of fluid drawn off. The operation may be repeated every three to five days. It sometimes happens that in a second puncture no fluid is obtained because the communication of the ventricles has been temporarily cut off. There are no bad results from the procedure, while the diagnostic value of the examination of the fluid withdrawn is great.

Diphtheria.—Disheartened by the loss of a case of diphtheria after the use of antitoxin, Richard Wood (*Med. Press*, June 6) now employs a spray containing chlorine every half hour, day and night. With this the patches of exudate sometimes disappear in two or three days. Feeding and necessary alcoholic stimulation are also important. The spray solution is prepared by placing in a dry bottle half a dram of potassium chlorate and on top of this twenty minims of hydrochloric acid and corking lightly. After ten minutes the contents of the bottle look green. Water is then added, one ounce at a time up to five ounces, and shaken. Half an ounce of syrup is added. The solution is valueless as a spray when it loses its color.

Measles.—R. C. Rosenberger (*Amer. Med.*, June) describes a cell found by him in serum obtained by blistering over the eruption with ammonia, in the early days of the disease. The serum was collected in sterile tubes and examined in the fresh state. With the oil immersion lens a more or less constant hyaline body was detected. In size it varied from one-tenth to one-sixth the diameter of a red blood cell. It was generally spheroid, while ovoid or pyriform forms were also seen. It was perfectly hyaline, and possessed or had attached to it a round or irregular oval-shaped granule of a brownish black color which was actively

motile. This granule traveled around the entire periphery of the body in a most deliberate manner, stopping every now and then, and appearing to try to gain an entrance into the body. Where this latter phenomenon was noticed the pyriform shape was best brought out. In two or three instances flagella were seen, but never more than two. In the same specimen of fluid another hyaline body, also motile but containing from two to four small motile granules, was occasionally seen. The first described hyaline body with the peculiar granule was observed in thirty-nine out of forty-one cases of measles, examined usually upon the second day of the disease. In the two unsuccessful instances the serum was not obtained until the fifth day of the eruption, when it was fading. The body was stained with Wright's blood stain, though poorly, and in these preparations the granule was seen to be situated eccentrically or upon the periphery. A few attempts were made to cultivate the body in small quantities of serum left in the tube, and incubated at 37° C., but without success. No bacteria were encountered in any of the preparations. The almost constant presence of this body seems suggestive. No similar bodies were identified in normal serum, the serum from a few cases of scarlet fever or from a number of syphilitics.

Cerebrospinal Meningitis in New York City during 1904 and 1905.—The tables and charts prepared by the commission appointed by the Department of Health to investigate this disease and submitted by John S. Billings (*N. Y. Med. Jour.* June) show the periodicity (about every ten years) of the outbreaks; the greater severity of the 1904-1905 epidemic than that of previous years; and the lack of correspondence between the general death rate and that from cerebrospinal meningitis. During 1905 there were reported 2,755 cases and information was obtained in 2,180. Of these, 55 per cent. were males, 45 per cent. females. Sixty-seven per cent. of the cases occurred in children under 10 years of age, and 15 per cent. in infants under one year. Only 19 per cent. of the patients were adults, and only 1 per cent. over 50 years of age. Fifteen per cent. of the patients were Italians. Next in frequency came Russians, Germans, and Irish; negroes constituted only 1 per cent. Of the patients, 76 per cent. lived in tenement houses. In 24 per cent. the halls, areaways, or yards (one or all), or the streets in front of the houses, were dirty and insanitary. In 13 per cent. the light was bad, in 10 per cent. the ventilation was insufficient, and the plumbing insanitary. In 10 per cent. the rooms were dirty, ill-kept, and dusty. A history of the existence of parasites (fleas, etc.) was obtained in 11 per cent. and in 13 per cent. animal pets were kept. A history of other cases of cerebrospinal meningitis in the same house or neighborhood was obtained in 19 per cent. of the cases. The commonest preceding disease was measles, followed by whooping-cough, diphtheria

and pneumonia in the order named. Clothing and food were unsatisfactory, and there was a lack of personal cleanliness in only 3 per cent. of the cases. A history of susceptibility to colds was given in 7 per cent. In only 6 per cent. of the cases had there been any direct exposure to other cases of cerebrospinal meningitis, and in only a small number was there evidence of direct transmission of the disease. In only 4 per cent. was there a history of exposure to over exertion, and in 3 per cent. of exposure to cold. In the majority of cases, the patients were well just previous to the onset of the disease, only 6 per cent. being in bad health. In all but 5 per cent. the onset was sudden. Stiffness of the neck was the commonest symptom, being present in 85 per cent. of the cases. Closely following it came vomiting, headache, and convulsions. An eruption was present in 30 per cent. of the cases, being petechial in 19 per cent. and herpetic in 11 per cent. Nasal discharge was noted in only 13 per cent. If the disease is always transmitted by the discharges, it would seem that nasal discharge should be more common. Kernig's sign, of great value in diagnosis, was absent in only 15 per cent. of the cases. Fever and leucocytosis were practically always present. Of complications, the eyes were most frequently involved. Next came paralysis of other muscles, then otitis. In 33 per cent. of the cases lumbar puncture was performed to confirm the diagnosis, and in 82 per cent. meningococci were found. Death occurred usually from coma and exhaustion. About 7 per cent. of the patients died on the first day, less than 34 per cent. during the first five days, and 39 per cent. after ten days. Of those who recovered 84 per cent. recovered completely. The majority of the patients did not recover until after the fourth week, but in ten cases (3 per cent.) recovery was stated to have taken place during the first week. Diphtheria antitoxin was used in 313 cases, of which 223 were fatal, a fatality of 71 per cent. Careful study of the individual cases failed to show any ground for believing that the antitoxin had any beneficial effect whatsoever. A very important point that has been brought out is that, in all probability, the disease is much more infectious during the first two weeks of its course. Guided by this, the Department of Health has enforced quarantine for at least the first two weeks, in all cases in which the patients remained at home the medical inspectors keeping the cases under observation, giving all necessary instructions, and ordering disinfection of the rooms and bedding on termination of the case. As a possible result of these precautions the number of deaths reported in the first nineteen weeks of 1906 have been 431 as compared with 1,300 in the same period for 1905

Ideas of Grandeur in General Paralysis of Children.—(*Rev. mens. des Mal. de l'Enfance*, March, 1906). M. L. Baronneix cites several authors among whom there is a belief that general paralysis is confined to the adult. Others, among whom the

author places himself, have observed many undoubted cases of general paralysis among persons under twenty years of age. In general the symptoms are the same in children and adults. The heredity is the same, specific and neuropathic; the lesions are the same; so are the symptoms and evolution of the disease. In the pathology of infancy are peculiarities worthy of mention. There is frequently a phlegmasia of the dura mater and adhesions to the internal envelopes of the brain; adhesions of the two hemispheres may exist; there is slight dilatation of the ventricles and increase of the cerebrospinal fluid; there is a tendency to atrophy of the convolutions. Paralysis attacks especially imbeciles and idiots among children. It has a sort of intermediate pathology between idiocy from meningitis and ordinary general paralysis. It is longer in its evolution than in the adult; from three to five years. There are contractures and anesthetics, manual inability, psychical troubles, loss of memory, confusion, lack of judgment. The characteristic element of general paralysis of children is simple, progressive, global dementia. There are no hallucinations, or ideas of persecution, and no delirium. But there are ideas of grandeur of a puerile type, connected with food and other simple subjects in which ordinary children are interested. The author has collected 14 examples of such ideas in children. They are characterized by their puerility, and are deformations of images that have become fixed in the memory. The natural tendency of the child is to enlarge, to deform conceptions, resulting often in apparent lying. This is exaggerated in the dementia of children. Ideas of grandeur, without being frequent, are not exceptional in general paralysis in persons under 20 years of age; but are found in twelve to fourteen per cent. of such cases. They are not observed in other nervous diseases under the age of twenty.

Symptoms of Fracture of the Skull in Infants.—Ernest Gasne (*Rev. Mens. des Mal. de l'Enf.*, June, 1906) tells us that in infants there are several characteristic symptoms which are not marked in fracture of the skull in the adult. The author bases his assertion on the observation of thirty-nine cases, most of which resulted from a fall from some height to the ground, alighting on the head. The symptoms are in the main the same in the child and the adult; what differs is the relative frequency and importance of the symptoms at the different ages. Under two years coma follows the fall, lasting for some hours or days, then the child awakes and shows few cerebral symptoms, the principal ones being motor, such as convulsions, contractures and paralysis, more or less transitory. The temperature, at first low, rises as in infections, then falls again. Vomiting and convulsions are frequent. The fracture may be felt, and there may be crepitation, with swelling and reddening of the face and hemorrhage of the conjunctiva. Pain is not marked. In severe cases there is a progressive elevation of temperature and death without

infection. In older children the collapse lasts longer, there are facial paralysis, hemiplegia, and Jacksonian epilepsy. Recovery is more frequent than in younger children. Ear symptoms are rare, but epistaxis is frequent. Much more serious are fractures of the ethmoid. In the adult, fever is a very grave symptom of brain trouble, but in the infant it does not necessarily indicate a bad prognosis. The author believes that it is reflex and the greater irritability of the infant accounts for its greater severity. Motor symptoms are frequent, and may be transitory. Hematoma of the dura mater is rare, and so is compression. Depression of the bones is well tolerated. The prognosis is much less grave than at first appears. In infants under two years about fifty per cent. recover. The proportion of recoveries increases with the age of the child, and the most favorable time is the sixth year of life. This relative benignity is in relation with the frequency of fractures of the vault in infants. Fractures of the base and temporal bone occur only in the most severe traumatisms and with wide-spread fracture of all the bones of the skull. In general, cerebral symptoms diminish as the case progresses. Fractures of the vault or base are less serious to life in the infant than in the adult, and prognosis is better, since most are in the vault. Prognosis should be reserved as to entire recovery in young infants.

Tics in Children.—Charles Herrman (*Arch. of Ped.*, June) describes the educational methods of treating such conditions. He has employed them in 10 cases, with six cures and four improving, and still under treatment. It consists of (a) immobilization of the parts affected to increase their control; (b) active exercises of the affected parts. The first is accomplished by seating the patient in front of a mirror while the physician, standing behind, directs him to remain perfectly quiet for a stated time, which is gradually increased as the patient receives ocular evidence of his ability to do so. The second part of the treatment is accomplished by active exercises, primarily of the affected parts: For the eyes, opening and closing both together, then each separately; for the mouth and lips, opening and closing alone and combined with opening and closing of the eyes. Reading aloud, recitation or singing. For movements of neck, trunk, and extremities, various systematic movements of flexion, extension, etc. All movements are performed slowly and gently, at command. Respiratory exercises are also of value, especially for respiratory tic and stammering. Standing against a wall, with arms at the sides, the patient takes a long inspiration, raising the shoulders, and then a long expiration, dropping them. Inhibition exercises are useful. A sharp instrument is brought quickly and repeatedly toward the eyes, while the child is told to resist the desire to wink or move the head. The face and other parts are tickled, pricked, or pinched, while the desire to move is resisted. These exercises are gone through

three times a day at regular hours, once a day at first in the physician's presence. Short at first, their duration is increased; a short rest is allowed between exercises the pupil then remaining perfectly quiet.

Intracranial Hemorrhage in the New-Born.—E. Scott Carmichael (*Scot. Med. and Surg. Jour.*, June) calls attention to the importance of examining the skull and its contents in all dead-born children, and in those which die shortly after birth, with symptoms of asphyxia. In spite of any after-treatment the paralysis resulting from intracranial hemorrhage at birth is often permanent, so that prophylaxis is of the greatest importance, and this can best be based upon a thorough knowledge of the pathology and etiology. Asphyxia is more commonly the exciting cause of hemorrhage, injury from application of forceps forming a very poor second as regards its etiology. The superior longitudinal sinus from its origin at the ethmoid bone to the torcular Herophyli, receives 10 to 12 veins on each side from the superior cerebral surface, 4 to 6 of these being large. These usually enter the sinus under cover of the parietal bone, especially close to the coronal and lambdoid sutures. The presence of these large vessels close to these cranial sutures suggests the possibility of their injury in the displacement and overlapping of the cranial bones during parturition. As the fissure of Rolands is nearer to the coronal suture in intrauterine life and soon after birth than later, any lesion of these vessels will rapidly affect the Rolandic areas. In some cases the superior longitudinal sinus is not situated mesially, so that the superior cerebral veins cross the suture unsupported and are liable to be nipped by overriding of the parietal bones. Lumbar puncture is advisable in all cases of severe asphyxia, especially if associated with increased intracranial pressure, as evidenced by a bulging anterior fontanelle. Early operation is important in all cases where symptoms persist for a few days, especially when convulsions and focal signs of pressure are present.

Effect of the Kindergarten on the Development of Children's Eyes.—Nelson L. North (*Brooklyn Med. Jour.*, June) calls attention to the severe strain which is put upon the undeveloped eyes of little children by paper weaving and similar kindergarten work. He has yet to find a child who has had a good start, free from care until his seventh year, and then starting the regular school courses, who did not stand as well as, if not better than, his kindergarten colleagues after a few years at school. The more fresh air and sunshine and freedom from restraint and confinement in the schoolroom, during the early years of life, other things being equal, the better will be the power to resist disease and the greater the activity and grasping power of the mind in later years.

Education of the Dullard in the Public School.—J. P. Haney (*Am. Jour. of Gyn. and Ped.*, June) says that the schoolroom is often the first step toward the penitentiary for the dullard. Such backward children should be taught in classes of not more than fifteen, preferably by a woman of sanguine, cheerful, optimistic disposition, quiet in manner and low-voiced. Her education should include study of the literature of the atypical child. All work must be individual and administered to meet specific needs. In the case of the duller pupils the first exercises must be those which will give control of the larger groups of muscles, drawing long lines, folding papers or planing a board. To those who have such control, finer exercises such as braiding, weaving, cutting, and chiseling, should be offered. The aim must be to develop increasing muscular skill. The pupil's interest is to be enlisted in constructive work, however crude, and the teaching of language, form and number made to take their rise from this. Physical exercise and gymnastic work should form part of the daily regimen, with a shower bath three times a week. If possible, a hot meal should be provided for the class at midday, or at least a glass of milk be given in addition to what they bring from home. They should not go home for luncheon, but eat at a common table, under direction of the teacher, and be taught to spread the table in an orderly fashion. Such classes tend to save from a useless, or too often a criminal career, a large percentage of their members. The expenditure by the State for their support is more than compensated for by the reduction which they cause in the criminal classes.

SOCIETY NOTICE.

THE American Association of Obstetricians and Gynecologists will hold its nineteenth annual meeting at the Hotel Havlin, Vine Street, between Fifth and Sixth Streets, Cincinnati, Thursday, Friday and Saturday, September 20, 21, and 22, 1906. The Fellows of the Association residing in Cincinnati constitute the committee of arrangements, of which Dr. Charles Lybrand Bonifield, 432 West Fourth Street, is the chairman, and Dr. Magnus A. Tate, Vindondissa Building, is the secretary, either of whom will furnish information to members and guests upon application. The association will meet in executive session with closed doors on Thursday, September 20, at 9.30 A.M. Address of welcome in open session at 9.50; reading of papers, 10 A. M. to 1 P.M. Recess will be taken for luncheon from 1 to 2.30 P.M. Afternoon session, 2.30 to 6 P.M. The evening session on the first day will be omitted. On Friday, morning session for the reading of scientific papers, 9.30 A.M. to 1 P.M.; afternoon session at 2.30. At 5.30 executive session with closed

doors. On Saturday, morning session, 9.30 A.M. to 1 P.M. Afternoon session at 2.30 and at 5 o'clock the closing ceremonies.

The following papers will be read: 1. The president's address, John Young Brown, Saint Louis. 2. Porro-Cesarean section for pregnancy complicating fibroids; mother and child saved, James F. Baldwin, Columbus. 3. Fixation of the kidney by shortening of the nephrocolic ligament; with report of cases, Charles A. L. Reed, Cincinnati. 4. Obstruction of the bowel from gallstone, Miles F. Porter, Fort Wayne. 5. Preservation of the vault of the vagina in pelvic operations, A. Vander Veer, Albany. 6. Title to be announced, James N. West, New York. 7. Diffuse peritonitis, John B. Murphy, Chicago. 8. Title to be announced, Richard Douglas, Nashville. 9. Abuse of purgatives in surgical patients, Edwin Walker, Evansville. 10. Atresia vaginæ; observations and experience on symptoms and treatment, Augustus P. Clark, Cambridge. 11. Title to be announced, J. H. Carstens, Detroit. 12. Title to be announced, M. Rosenwasser, Cleveland. 13. Intestinal obstruction; report of cases, Rufus B. Hall, Cincinnati. 14. Vaginal celiotomy; its indications and limitations, Samuel Wyllis Bandler, New York. 15. The rectum in pelvic disease, H. O. Pantzer, Indianapolis. 16. The Gilliam operation for displacement of the uterus, D. Tod Gilliam, Columbus. 17. Title to be announced, X. O. Werder, Pittsburg. 18. Title to be announced, Louis Frank, Louisville. 19. Title to be announced, Walter B. Dorsett, Saint Louis. 20. Title to be announced, W. A. B. Sellman, Baltimore. 21. Title to be announced, Charles G. Cumston, Boston. 22. Title to be announced, Wm. H. Wenning, Cincinnati. 23. Report of a case, William H. Humiston, Cleveland. 24. Reflex dyspepsias from abdominal and pelvic disease, H. E. Hayd, Buffalo. 25. Peritoneal adhesions, Robert T. Morris, New York. 26. Kidney and colon suspension by use of the gastric capsule and nephrocolic ligament, Howard W. Longyear, Detroit. 27. Title to be announced, John D. S. Davis, Birmingham. 28. Title to be announced, Walter B. Chase, Brooklyn. 29. Title to be announced, Thomas B. Eastman, Indianapolis. 30. Title to be announced, O. H. Elbrecht, Saint Louis. 31. Trend of the times in appendectomy, N. Stone Scott, Cleveland. 32. Puncture of the nonpuerperal uterus with prolapse of the bowel; violent seizure and tearing away of sixteen inches of gut; prompt abdominal section, intestinal anastomosis, and repair of uterine lacerations; recovery, Charles E. Congdon, Buffalo. 33. Epithelioma of the female urethra; a clinical note, L. S. McMurtry, Louisville. 34. Title to be announced, Joseph Price, Philadelphia.

Fellows and visitors are requested to register promptly on arrival. All members of the medical profession are cordially invited to attend the scientific sessions.

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ORIGINAL COMMUNICATIONS.

A CAREFUL STUDY OF THE PARAMETRIUM IN
TWENTY-SEVEN CASES OF CARCINOMA CERVICIS
UTERI AND ITS CLINICAL SIGNIFICANCE.*

BY

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(With thirty illustrations.)

CLINICAL experience has taught us that cancer of the uterine cervix is one of the most dreaded as well as frequent forms of malignant neoplasm. The diagnosis is usually not made until after the growth has extended beyond the possibilities of operative relief, and in only a very small percentage of the cases operated upon has the cure been permanent.

Judging from the clinical manifestations of the disease, its course is rapid, the patients rarely living over three years, and about three-quarters of them dying within two years, and one-third within one year, after its first manifestation. Furthermore, the disease progresses more rapidly in the younger women and pregnancy apparently increases the rapidity of its growth. The above naturally suggests the importance of an early diagnosis,

*Candidate's Thesis American Gynecological Society from the Gynecological Department, Johns Hopkins Hospital, Baltimore, Md.

as a short period of neglect in such a rapidly growing tumor might permit the growth to extend beyond operative treatment. This early diagnosis is possible in the majority of cases, because in over sixty per cent. of 412 cases admitted to the Johns Hopkins Hospital there was a history of neglected uterine bleeding for over six months; and in over half of the twenty-seven cases reported in this paper, neglected uterine bleeding had been present for over six months, and these patients had all been operated upon during the last four years.

The results of the operative treatment in the past show that the disease usually reappears in the vaginal vault, indicating that either the growth had not been entirely removed at operation or that there had been an implantation of cancer during it, or else that there had been a true recurrence of the disease. These facts have not only suggested the importance of an earlier diagnosis to many operators, but also the importance of a more radical operation, in order not only to remove more widely this tissue about the cervix in which cancer usually has reappeared after hysterectomy, but also to extend the operation still further and remove the pelvic lymphatics. It is too early to make definite statements in regard to the clinical results of these more radical operations, and especially as to the advisability of the removal of the pelvic lymph nodes, but the results, so far, indicate that in the wide incision of the parametrium, we have a means of not only operating on more advanced cases than previously, but also of curing a much larger percentage of all cases seen.

These operations have furnished us with specimens, for pathological study, which differed from those of the former operations, in that they contain the tissue in which the growth had formerly remanifested itself, and which had not been removed by the vaginal or usual abdominal hysterectomy. I refer to the parametrium, whose tissues are usually first invaded by the extension of the disease and in which the growth has usually first appeared after hysterectomy.

The careful studies of Kundrat (*Arch. f. Gyn.*, 1903, LXIX, 355-409) in Wertheim's Clinic have been of great value in explaining the results of the operative treatment of this condition. Baisch's careful work (*Arch. f. Gyn.*, 1905, LXXV, 273-299) in Doederlein's Clinic has been confirmatory of the findings of Kundrat. Kundrat found in eighty cases studied

that both the parametrium and pelvic lymph nodes were free from cancer in thirty-two. In forty-eight cases the growth was found to have extended beyond the uterus and in all but four of these cases the parametrium of one or both sides was involved. In twenty-two cases the parametrium was involved but not the pelvic lymph nodes, suggesting that the former had temporarily checked the further extension of the disease, and in addition it was involved on one or both sides in twenty-two of the twenty-six cases in which the pelvic lymph nodes were found to be cancerous. Kundrat's work is above criticism as it is based on serial sections of the parametrial tissue and lymph nodes from eighty cases of carcinoma of the cervix, operated upon at Wertheim's Clinic. Three years were consumed in the work and over 21,000 microscopic sections were studied.

The work I wish to present is based on the careful study of twenty-seven specimens removed at Dr. Kelly's Clinic at the Johns Hopkins Hospital, Baltimore, Md. (Here I wish to thank both him and his associates for the privilege of studying this material.) In all cases a drawing, to measure, was made of the specimens removed as well as of the vaginal portion of the cervix; and in several cases plaster casts of the latter were also made. The entire specimen, without cutting it open, was then hardened in 4 per cent. formalin. After this, a thin sagittal slice, about 2 mm. thick, was removed from the center of the specimen, thus dividing the specimen into two halves with the loss of only about 2 mm. of tissue. This slice (either as a whole or else divided, if too large) was fixed, imbedded in celloidin, cut and stained, thus giving a stained sagittal section of the entire uterus. Cross sections of the parametrium on each side with half of the cervix attached, were made, dividing this tissue into four or five blocks, depending on the length of the cervix. These blocks were numbered, fixed, imbedded in celloidin and cut. In some instances every fifth section was stained, mounted in water and, if interesting, saved and permanently mounted in balsam, in other cases only the apparently interesting ones were stained and in still other cases portions of the blocks were cut and stained in series. The varied technique depended upon the appearance of the tissue as it was cut, for with practice, one becomes quite expert in detecting pathological changes in even an unstained section of the parametrium. The result

of this work gave an incomplete series of sections through the parametrium of each side with cervix attached. From these, the growth was reconstructed, thus showing its approximate relation to the specimen removed.

Some of the pelvic lymph nodes had been removed in nineteen of the twenty-seven cases and were studied by cutting each node and placing the sections in a bottle and staining them all at one time, and then removing the stained sections, mounting them in water and examining them under the microscope until cancer was either found or else excluded.

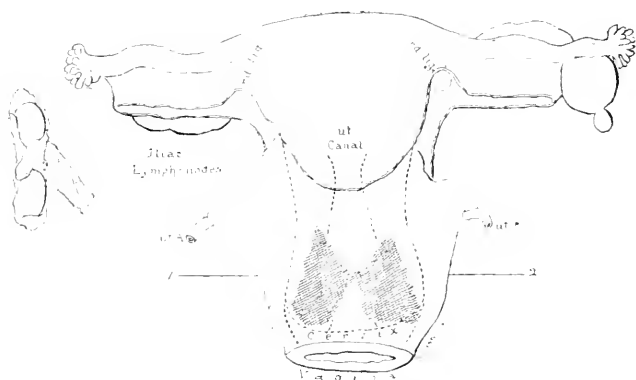


Fig. 1.—Small Primary Growth; Parametrium and Pelvic Lymph Nodes Apparently Free (*Gyn. Path.* No. 6848).

Patient 58 years old; thirteen children (30-9 years); menopause two and one-half years ago. Only symptom was a slight, but constant, blood-tinged discharge of eight months' duration, following a slight hemorrhage at the onset. Condition was good, hemoglobin 90 per cent. Clinically, the uterus was freely movable and parametrium apparently felt normal. Type of growth was "Squamous Celled Cancer, Vaginal Portion of the Uterine Cervix; inverting, with possibly a double focus."

Reconstruction of the growth, in specimen removed, ($\times \frac{1}{2}$.) shows the extent of the growth and the conditions found are indicated.

Before considering the findings in these twenty-seven cases, it is well to speak of the various types of cervical cancer, and their significance; for the different types vary in their frequency, appearance, manner of growth and malignancy.

I. Histologically, we may classify cervical cancer into *squamous-celled carcinoma* and into *adenocarcinoma* according to the form of epithelium present in the growth. The vaginal portion of the cervix is normally covered by stratified epithelium, which is directly continuous with that of the vagina and usually ends

at the external os, but may extend up into the cervical canal for varying distances, especially in older women. Cancer arising from this form of epithelium, whether from the vaginal portion of the cervix or the cervical canal, is known as the squamous-celled carcinoma. This is probably the more important variety, for it is the more frequent, twenty-four of the twenty-seven cases being of this type and nineteen of them apparently arising from the vaginal portion of the cervix.

The cervical canal, on the other hand, is usually lined by high cylindrical cells which generally meet the stratified epithelium at the external os, but may extend beyond it, over the vaginal portion of the cervix. Cancer arising from this form of epithelium, irrespective of its place or origin, whether within the cervical canal or from the vaginal portion of the cervix, is

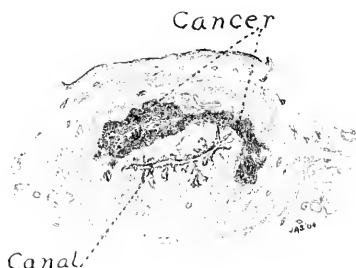


Fig. II.—Stained Cross Section of the Cervix and Parametrium (Slightly Reduced), Taken at the Line 1-2, Indicated in Fig. I.

The growth is well surrounded by cervical tissue and its relation to the cervical canal is shown, having invaded the cervical tissues posterior to it.

known as the cylindrical-celled or adenocarcinoma. This occurs less frequently than the other variety (three of the twenty-seven cases), but it is apparently more malignant, while its usual origin within the cervical canal (all three cases) makes its diagnosis more difficult.

II. Topographically, we may classify cervical cancer into those arising from the *vaginal portion* of the cervix and those arising from within the *cervical canal*. The importance of this classification is very evident, for cancer arising from the former would probably give rise to symptoms earlier than a similar growth arising from the latter and, furthermore, would be more readily diagnosed on inspection or palpation. In nineteen of the twenty-seven cases the growth apparently arose from the

vaginal portion of the cervix and in each instance was of the squamous-celled variety. In the very advanced cases, it may be impossible to ascertain the origin of the growth, though cancer arising from the vaginal portion of the cervix usually invades the deeper tissues of the cervix (frequently of one lip) and does not involve the cervical canal until late in the course of the disease, while cancer arising from the cervical canal involves the surface of this and then invades the cervix on all sides, but the vaginal surface of the cervix may not be involved, or not until after the disease has become very extensive.

III. Morphologically, we may classify them according to the form of the growth, irrespective of its histological structure or its situation. We do not know why in one case the growth seems to "evert," giving rise to a papillary or a cauliflower mass, while in another case apparently the same type of growth "inverts" forming a nodule of cancerous tissue in the cervical wall, with but very little evidence of the disease on the surface until after necrosis and ulceration have taken place. The malignant process may be circumscribed in one instance, and apparently the same type of growth may be diffusely scattered throughout the cervical tissue in another. Intermediate forms, and sometimes both processes, are present in the same specimen. In the progress of the disease, the growth may, apparently, sometimes pass from one type into another. Usually it may be classified according to the predominating type, whether *everting* or *inverting*. The everting form occurs less frequently and is usually of the squamous-celled variety and more often arises from the vaginal portion of the cervix. Only six of the twenty-seven cases were apparently of this variety and five of them were squamous-celled and all but one arose from the vaginal portion of the cervix. On the other hand, twenty-one cases were of the inverting type, nineteen of them being squamous-celled, and in fifteen cases arose from the vaginal portion of the cervix.

A study of these cases suggests that the adenocarcinoma is relatively infrequent but is the most malignant form; that the evertive type of the squamous-celled carcinoma arising from the vaginal portion of the cervix is also relatively infrequent but at the same time, the most benign form. On the other hand, the invertive type of the squamous-celled carcinoma is the most frequent variety, whether arising from the vagina

portion of the cervix (its more frequent origin) or from within the canal, is unfortunately usually very malignant, and for these two reasons constitutes the most important group.

From the study of the parametrium and pelvic lymph nodes in our specimens, we may consider the following groups of cases:

- (1) Parametrium and pelvic lymph nodes free from cancer.
- (2) Parametrium free but pelvic lymph nodes infected by cancer.

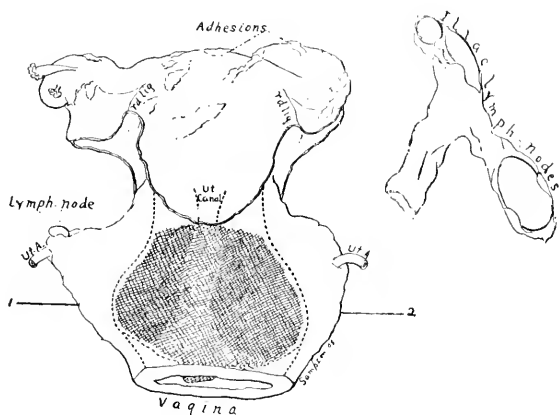


Fig. III.—Large Primary Growth, but Parametrium and also Possibly the Pelvic Lymph Nodes are Free (*Gyn. Path.* No. 7467).

Patient 50 years old; three children (25–20 years); menopause one year ago. Bleeding, for three months, was first noticed when straining at stool; severe hemorrhages six weeks ago and more or less constant offensive watery discharge for several weeks, but no pain. Condition was good, hemoglobin 74 per cent. Movements of the uterus were limited by pelvic adhesions but the parametrium felt normal. Type of growth was probably the same as shown in Figs. I and II, but apparently a single focus.

Reconstruction of the growth, in specimen removed, ($\times \frac{1}{2}$), shows the extent of the growth, which is still confined within the cervical tissue. The pelvic adhesions are shown which limited the movements of the uterus. The growth extends up to, but not beyond, the internal os.

- (3) The direct extension of the growth into the parametrium.
- (4) Metastases of the disease to the lymph structures of the parametrium.
- (5) Metastases to the pelvic lymph nodes.

We may also consider another classification of these cases, which is also of great clinical importance.

- (1) Limitation of the movements of the uterus, caused by adhesions from inflammatory disease of the uterine appendages (independent of cancer) which may deceive one as to the extent

of the malignant process and also increase the difficulties of the operation.

(2) Limitations of the movements of the uterus resulting from adhesions from inflammatory disease of the uterine appendages, caused by cancer.

(3) Indurated feeling parametrium in which cancer was found.

(4) Indurated feeling parametrium in which cancer was not found.

(5) Clinically normal parametrium in which cancer was found.

Parametrium and Pelvic Lymph Nodes Free from Cancer.—

In ten of the twenty-seven cases, I was unable to find any evidence of cancer in the parametrium, but in three of the former

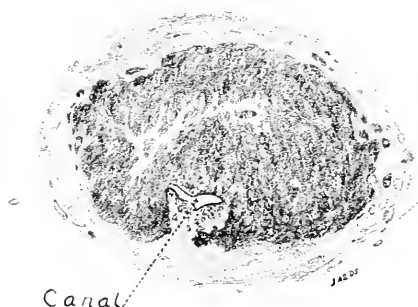


Fig. IV.—Stained Cross Section of the Cervix and Parametrium (Slightly Reduced), Taken at the Line 1-2, Indicated in Fig. III.

The large growth is still surrounded by cervical tissue; it has invaded the tissues of the posterior cervical wall, as in Fig. II, and has partly invaded that of the anterior cervical wall, but the cervical canal is not, as yet, entirely surrounded by cancer.

cases cancer was found in the pelvic lymph nodes. This demonstrates that in only seven of the twenty-seven cases is there a possibility of the growth being limited to the uterus, because we know that it had invaded either the parametrium or the pelvic lymph nodes or both, in twenty of the specimens. The chances of overlooking cancer, as well as the fact that in three of the seven cases where the growth was apparently local the pelvic lymph nodes were not removed, suggest that possibly the disease may have also extended beyond the uterus in one or more of the seven apparently early cases. An early growth with parametrium and pelvic lymph nodes free is shown in Figs. I and II, and a much larger growth with possibly a similar condition is shown in Figs. III and IV.

Parametrium Free but Pelvic Lymph Nodes Infected by Cancer.

—The pelvic lymph nodes were studied in nineteen cases and one or more lymph nodes were found involved in nine, while in three of the latter cancer was not found in the parametrium of either side. This shows that we may have an early growth, in which the disease has apparently passed through the parametrium, without infecting it, but nevertheless has invaded the pelvic lymph nodes beyond. One of these cases is shown in Figs. V and VI. Possibly a similar condition may have been

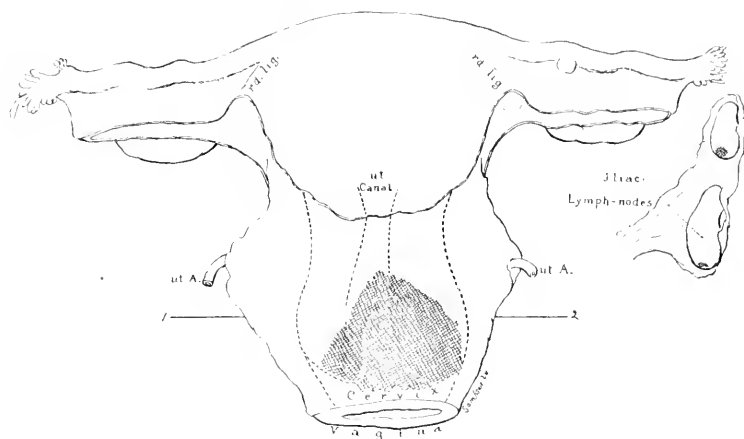


Fig. V.—Small Primary Growth, Parametrium Free but Pelvic Lymph Nodes Infected by Cancer (*Gyn. Path.* No. 6543).

— Patient 54 years old; eight children (ages ?); menopause one year ago. Bleeding for two months was the only symptom. Condition was good, hemoglobin 70 per cent. Uterus was freely movable and parametrium felt normal. Type of growth was the same as the two previous ones.

Reconstruction of the growth, in specimen removed, ($\times \frac{1}{2}$), shows a small primary growth surrounded by cervical tissue, parametrium free but cancer in the pelvic lymph nodes.

present in one or more of the three early cases in which the pelvic lymph nodes were not removed. This condition was also found in a patient, recently operated upon by me, but not included in this series.

The Direct Extension of the Growth into the Parametrium.—

This is the most frequent manner in which the parametrium is invaded by cancer, occurring in fourteen of the seventeen cases in which such invasion occurred. Moreover, metastases, to the lymph structures of the parametrium, were also present in six of these cases. Of great clinical importance is the fact

that the parametrium may be cancerous while the pelvic lymph nodes are free, demonstrating that the parametrium may be able to check the disease temporarily and, accordingly, if we can remove the entire local growth we may be able to cure a large percentage of such cases (see Figs. VII and VIII).

Schauta (*Monat. f. Geb. u. Gyn.*, 1904, XV, 475-521) studied the pelvic and abdominal lymph nodes in sixty cancerous patients coming to autopsy. Forty died from the natural termination of the disease, nine from intercurrent affections and eleven as the result of operation, and 43.3 per cent. of them were entirely free from metastases.

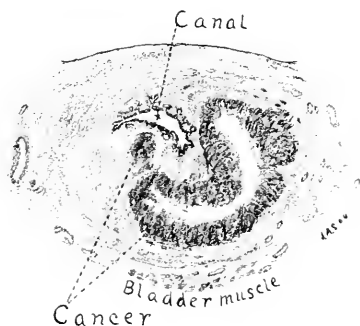


Fig. VI.—Stained Cross Section of the Cervix and Parametrium (Slightly Reduced), Taken at the Line 1-2, Indicated in Fig. V.

The growth is still confined within the boundaries of the cervix and has invaded the deeper tissues of the anterior wall of the cervix, rather than the canal, just as the posterior wall was invaded in the specimens shown in Figs. II and IV. Necrosis has occurred, forming a deep ulcer which appears as a cavity in the cross section.

The pelvic lymph nodes were studied in eleven of the fourteen cases of our series, in which the disease had invaded the parametrium by direct extension; in six cancer was not found in the pelvic lymph nodes, thus suggesting that the disease may have been still local in half of these cases. The direct extension of the disease may present two pictures. In the first, the diseased area may be nearly entirely surrounded by healthy cervical tissue except where fine thread-like processes of cancer, here and there, invade the parametrium, frequently either in the main lymph vessels or in the lymph spaces about the nerve sheaths (see Figs. IX and X). In the second, which is possibly a later stage of the first, the disease has invaded the parametrium

en masse, forming a common tumor with the primary growth. Possibly the outer borders of the growth may present the fringed appearance similar to that observed in an apparently early stage of the invasion of the parametrium (see Figs. XI and XII). In still other cases the growth may reach the parametrium and there spread out, forming a mass of cancerous tissue connected with the main growth by a narrow isthmus (see Fig. XI) so that

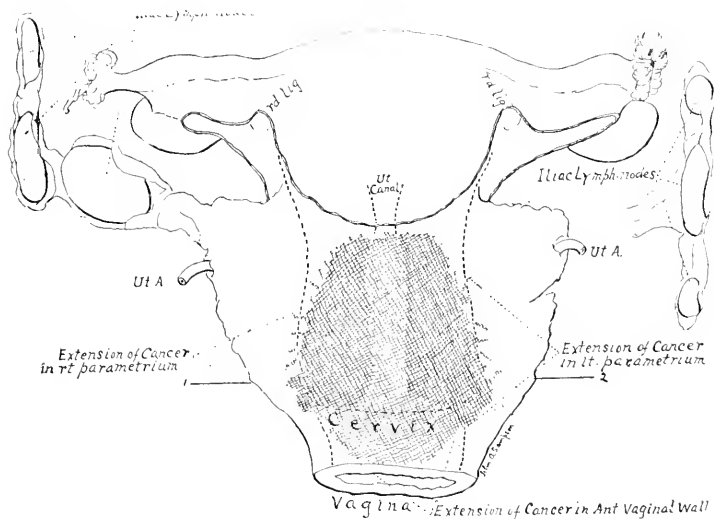


Fig. VII.—Large Primary Growth, with Direct Extension into the Parametrium as Thread-like Processes, but Pelvic Lymph Nodes are Apparently Free. (*Gyn. Path.* No. 7468).

Patient 37 years old; seven children (15–2½ years). Bleeding was the only symptom; of two years duration, at first irregular but very profuse, constant the last three months. Patient was anemic; hemoglobin 55 per cent. Parametrium was apparently indurated, growth had involved the deeper tissues of the vagina all around the cervix. Type of growth was squamous-celled cancer, cervical canal, inverting (scirrhous).

Reconstruction of the growth, in the specimen removed ($\times \frac{1}{2}$), shows an extensive growth involving the parametrium and vagina on all sides, but the pelvic lymph nodes, while they were enlarged were apparently free.

in some cross sections it may simulate a metastasis to the parametrium (see Fig. XVI).

Metastases of the Disease to the Lymph Structures of the Parametrium.—This is of quite frequent occurrence, and was noted in nine of the seventeen instances where the parametrium was involved, and in three of the former metastases were present in

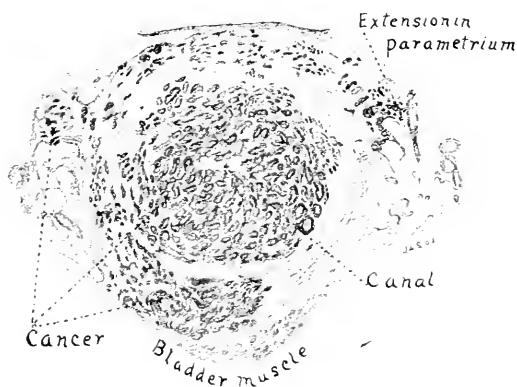


Fig. VIII.—Stained Cross Section of the Cervix and Parametrium (Slightly Reduced), Taken at the Line 1-2, Indicated in Fig. VII

The growth has involved the entire cervix in a diffuse manner, spreading out from the cervical canal; the thread-like extensions into the parametrium are also shown.

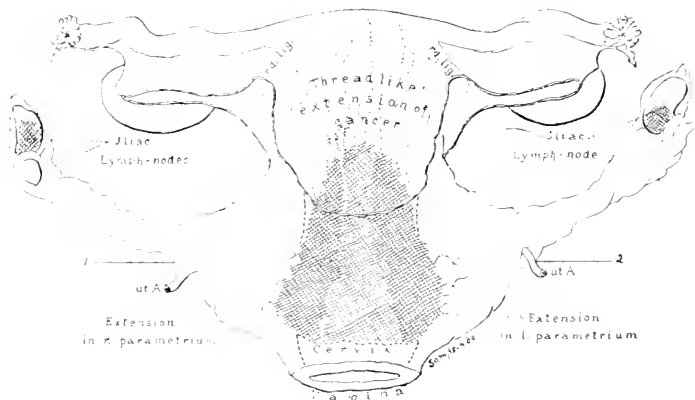


Fig. IX.—Large Primary Growth with Direct Extension into the Parametrium and Body of the Uterus as Thread-like Processes; Pelvic Lymph Nodes also Cancerous (*Gyn. Path.* No. 7419).

Patient 37 years old; six children (14 years to 13 months). Bleeding had been present for ten months, began three months after last child was born; also pain in back. Condition was fairly good, hemoglobin 73 per cent. Movements of the uterus were restricted by the posterior extension of the disease and also by the apparently indurated parametrium. Type of growth was squamous-celled cancer, vaginal portion of cervix, inverting.

Reconstruction of the growth, in the specimen removed, ($\times \frac{1}{2}$) shows the thread-like extensions of the disease into the parametrium and body of the uterus and also the cancer in the lymph nodes.

the parametrium without any evidence of a direct extension of the disease through the cervical tissue surrounding the primary growth. In eight cases these metastases were present in lymph nodes and in only one instance was there an apparent metastasis in a lymph channel, although, owing to faulty technique (in not saving and mounting a sufficient number of the sections in series at this place), I am unable to eliminate the possibility of this being a direct extension. In only one other instance was cancer found in a lymph channel, and here I was able to show that it was due to a direct extension backward from an infected lymph node. Apparently, therefore, cancer, once gaining access to a lymph channel, either grows in the channel in continuity with the primary growth or, if set free, is usually

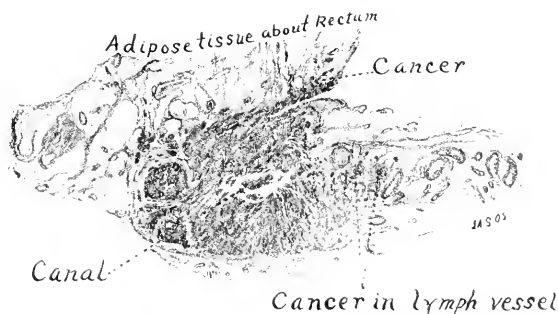


Fig. X.—Stained Cross Section of the Cervix and Parametrium (Slightly Reduced), Taken at the Line 1-2, Indicated in Fig. IX.

The cervix has been entirely replaced by cancer, which has extended posteriorly, obliterating the cul-de-sac and invading the adipose tissue about the rectum. A thread-like extension in a lymph vessel of the left parametrium is shown in cross section (cut twice).

carried on and does not become arrested until it reaches a lymph node, whether it be situated in the parametrium or about the pelvic vessels.

In this connection we must consider three groups of lymph nodes to which cancer may metastasize and in addition a fourth one in which I have never observed metastases:

- (1) The relatively large lymph node frequently found near where the uterine artery crosses the ureter.
- (2) Numerous small lymph nodes scattered throughout the parametrium.
- (3) Newly formed lymph nodes projecting into the lymph channels.

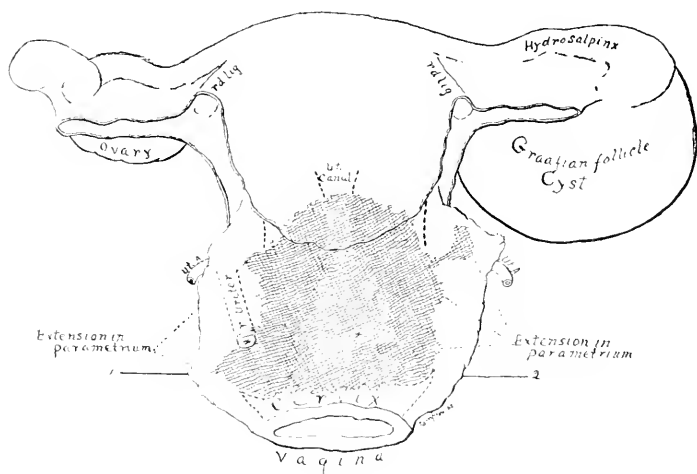


Fig. XI.—Large Primary Growth with Direct Extension into the Parametrium, (Gyn. Path. No. 6715).

Patient 36 years old; seven children (18-5 years). Uterine bleeding alternating with a foul discharge had been present for four months; slight pain in the lower abdomen was probably due to adhesions from pelvic inflammatory disease. General condition was fairly good. Movements of the uterus were restricted by the pelvic adhesions and by the indurated parametrium.

Type of growth was the same as in Figs. IX and X.

Reconstruction of the growth, in the specimen removed, ($\times \frac{1}{2}$), shows the involvement of the parametrium by the growth *en masse*, and that, although the primary growth is extensive, the body of the uterus has been invaded for only a short distance. Cancer was found in a pelvic lymph node of the left side.



Fig. XII.—Stained Section of the Cervix and Parametrium (Slightly Reduced), Taken at the Line 1-2, Indicated in Fig. XI.

The growth has invaded the parametrium on each side and the bladder wall anteriorly.

(4) Newly formed lymph nodes which, apparently, do not bear any relation to the lymph channels and in which I have never seen metastases.

(1) *The Relatively Large Parametrial Lymph Node Sometimes Found Near the Crossing of the Uterine Artery and the Ureter.*—This is not always present. In two instances I have found it cancerous and one of these is shown in Figs. XIII and XIV. As seen in Fig. XIII it may have temporarily checked the fur-

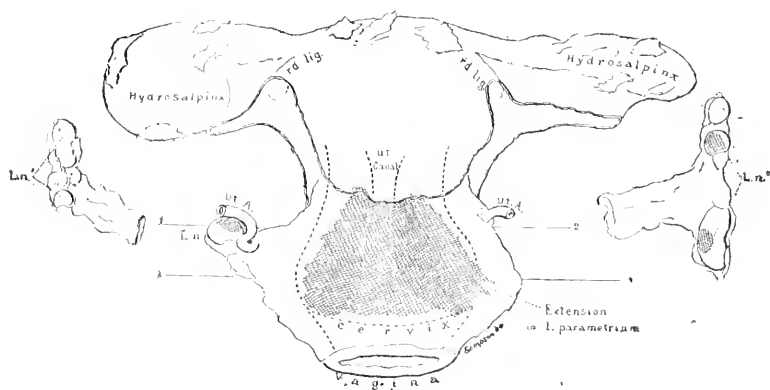


Fig. XIII.—Metastasis of Cancer to a Large Parametrial Lymph Node (Occasionally Present) (*Gyn. Path.* No. 7077).

Patient 36 years old; one child (age ?). History was unsatisfactory. Bleeding had been present for only a few days, but probably she had been curetted a month ago. Pain was of seven weeks' duration, probably due to adhesions from an extensive pelvic inflammatory disease. General condition was excellent, hemoglobin 100 per cent. Movements of the uterus were restricted by pelvic adhesions, parametrium on the left side felt slightly indurated. Type of growth was the same as in Figs. XI and XII.

Reconstruction of the growth, in the specimen removed, ($\times \frac{1}{2}$) shows the direct extension of the growth into the left parametrium; the metastasis to the large parametrial lymph node on the right side and the metastases to the pelvic lymph nodes on the left side, but those on the right are free, possibly the parametrial lymph node of that side had prevented cancer reaching those nodes.

ther advance of the disease, for it was cancerous on the right side while the pelvic lymph nodes beyond were free; on the other hand it was absent on the left side and the left pelvic lymph nodes contained cancer.

(2) *The Smaller Parametrial Lymph Nodes.*—These are typical lymph nodes and occur, normally, in varying numbers. I have found cancer present in them in three cases, in two of

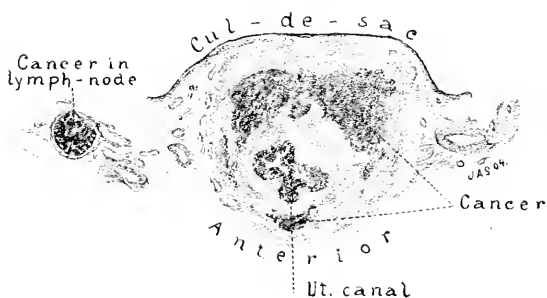


Fig. XIV.—Stained Cross Section of the Cervix and Parametrium (Slightly Reduced), Taken at the Line 1-2, Indicated in Fig. XIII.

The growth has invaded the deep cervical tissues about the cervical canal and a metastasis is present in the large lymph node in the right parametrium.

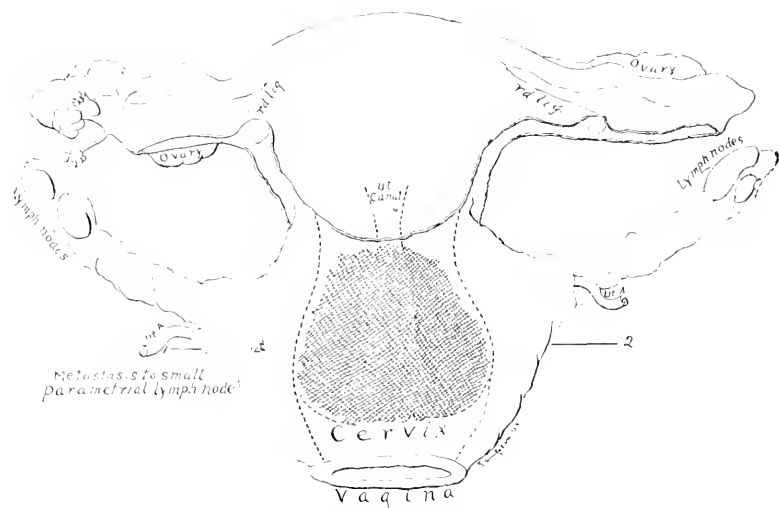


Fig. XV.—Metastasis of Cancer to a Small Parametrial Lymph Node (*Gyn. Path.* No. 6669).

Patient 62 years old; two children (45-43 years); menopause nine years ago. Bleeding at irregular intervals had been present for seven weeks, usually when straining at stool, and at one time amounting to a severe hemorrhage. A very profuse watery discharge, not offensive, had been present for four months. General condition was poor, hemoglobin 68 per cent. Uterus was freely movable, parametrium felt normal. Type of growth as in Figs. XIII and XIV.

Reconstruction of the growth in the specimen removed, ($\times \frac{1}{2}$), shows that the only evidence found of the disease outside of the uterus was in a small lymph node in the right parametrium. The internal os marks the upper limit of the growth.

which the primary growth was everywhere apparently surrounded by cervical tissue. One of these cases is shown in Figs. XV and XVI. In this instance the pelvic lymph nodes were also studied and cancer was not found in those examined. In this case the growth in the lymph node had extended backward into the afferent lymph channel so that cross sections at certain levels gave the appearance of a metastasis to a lymph channel, as has previously been mentioned. In another case, of adenocarcinoma of the cervix, the disease had invaded the lymph channels of the parametrium by direct extension and had metastasized to one of these lymph nodes (see Figs. XVII and XVIII). In all these cases the disease process led to but very little alteration

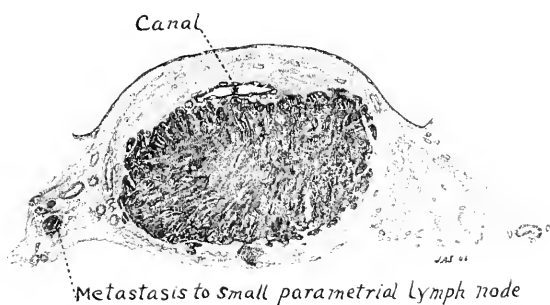


Fig. XVI.—Stained Cross Section of the Cervix and Parametrium (Slightly Reduced), Taken at the Line 1-2, Indicated in Fig. XV.

The growth has invaded the tissues of the anterior cervical wall, causing a pressure atrophy of the posterior wall, the cervical canal being intact. A metastasis is present in the small lymph node in the right parametrium.

in the size of the node or in the structure of the surrounding tissue.

(3) *The Apparently Newly Formed Lymph Nodes Projecting into the Lymph Channels, i.e., the Intravascular Lymph Nodes.*—I do not know the significance of these nodes. They were not present in the parametria, obtained at autopsy, from six women dying of various causes other than cancer, and they were present in four of the twenty-seven specimens reported in this article. Their number varies in different cases, eight being found in one section of the parametrium, of one side, and they project into the lumen of the lymph channels like a sponge. In three of the four cases cancer was demonstrated in one or more

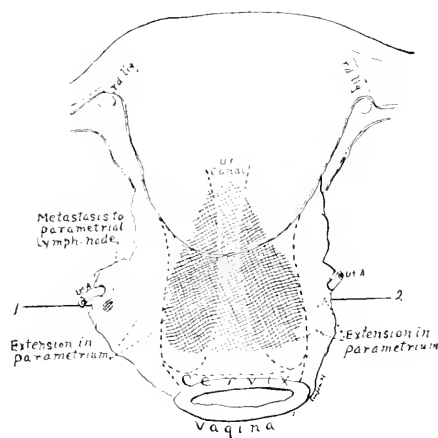


Fig. XVII.—Metastasis of Cancer to a Small Parametrial Lymph Node (*Gyn. Path.* No. 6603).

Patient 37 years old; four children (21-15 years). Bleeding began seventeen months ago, and seven months ago a fungoid growth was removed from the cervix and there has not been any bleeding since, but for the last five months there has been severe pain in lower abdomen and back, requiring morphia. General condition was fairly good, hemoglobin 60 per cent. Uterus was freely movable, parametrium on each side felt normal. Type of growth was adenocarcinoma, cervical canal, probably everting at first.

Reconstruction of the growth in the specimen removed, ($\times \frac{1}{2}$) shows the direct extension of the growth into the parametrium and also the metastasis to a small lymph node. The growth has invaded the body of the uterus, extending along the endometrium.

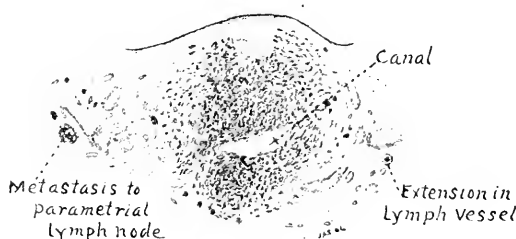


Fig. XVIII.—Stained Cross Section of the Cervix and Parametrium (Slightly Reduced), Taken at the Line, 1-2, Indicated in Fig. XVII.

The growth has spread out from the cervical canal invading the parametrium by direct extension and metastasis.

of these nodes. They have been fully described by Kundrat who found metastases to these nodes in fifteen of the eighty specimens studied. Possibly they are rudimentary lymph nodes, and later develop into the small lymph nodes previously described.

Illustrations of metastases to these nodes may be seen in Figs. XIX and XX. The one shown in Figs. XXI and XXII is particularly interesting as the node is situated in the lymph channel just before it reaches the large lymph node, sometimes found at the crossing of the uterine artery and the ureter and,

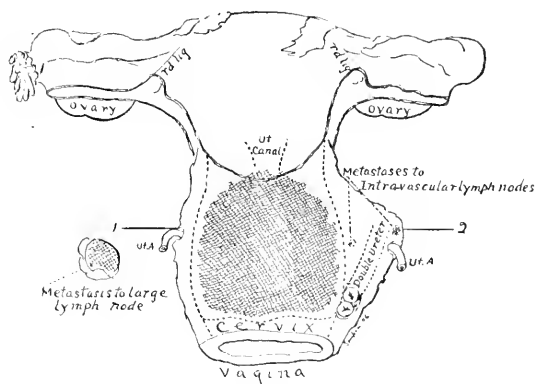


Fig. XIX.—Metastasis of Cancer to Intravascular Lymph Nodes of the Parametrium (*Gyn. Path.* No. 6074).

Patient 54 years old; six children (ages ?); menopause six years ago. Bleeding had been present for eight months, constant, but never profuse, no other symptom. General condition was good, hemoglobin 75 per cent. Uterus was movable, parametrium of the right side was apparently normal; that of the left felt slightly indurated. Type of growth was squamous-celled carcinoma, cervical canal, inverting.

Reconstruction of the growth in the specimen removed, (x $\frac{1}{2}$), shows metastases to two intravascular lymph nodes in left parametrium and metastasis to a large parametrial node on the right side. Primary growth is limited to the cervix, upper limit is at the internal os.

like a policeman, had "held up" the cancer before it had reached the larger lymph node.

(4) *Newly Formed Lymph Nodes which Apparently Do Not Bear Any Relation to the Lymph Channels and which Apparently Are Not Infected by Metastases of the Growth.*—Collections of lymphoid tissue about bloodvessels may be present in large numbers, appearing in the section as darkly stained areas, the size of a miliary tubercle. They apparently owe their origin to some stimulus, directly or indirectly caused by the new

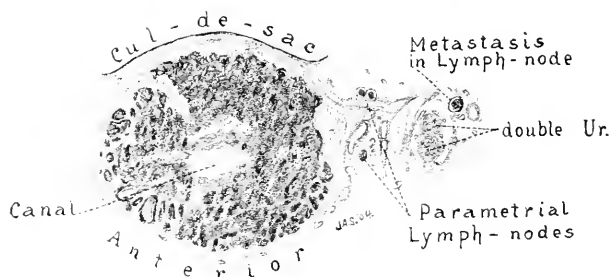


Fig. XX.—Stained Cross Section of the Cervix and Parametrium (Slightly Reduced), Taken at the Line 1-2, Indicated in Fig. XIX.

The primary growth is limited to the cervix, but a metastasis is indicated in a small intravascular lymph node situated lateral to the double ureter.

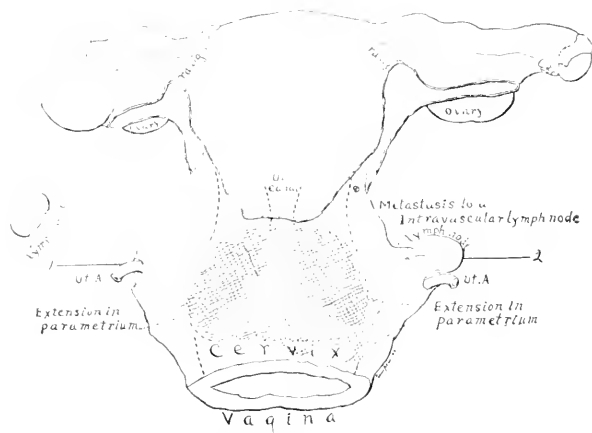


Fig. XXI.—Metastases of Cancer to Intravascular Lymph Nodes of the Parametrium (*Gyn. Path.* No. 7602).

Patient 40 years old; three children (ages?). Uterine bleeding and a foul, watery discharge had been present for eight months, patient had been treated locally with electricity, twice a week, during the last four months. The pain present was probably due to adhesions from pelvic inflammatory disease. General condition was fairly good, hemoglobin 70 per cent. Movements of the uterus were slightly restricted and the involvement of the left side of the vagina probably accounted for the apparent indurated parametrium of that side. Type of growth was squamous-celled carcinoma, vaginal portion, inverting.

Reconstruction of the growth in the specimen removed, ($\times \frac{1}{2}$), shows the direct extension of the disease into the parametrium and left side of vagina and the metastasis to the small intravascular lymph node of left parametrium.

growth, but do not necessarily bear any relation to the lymph channels, unless the so-called intravascular lymph nodes owe their origin to the invasion of a lymph channel by a bloodvessel carrying with it one of these collections of lymphoid tissue just as occurs in the embryo as shown by Sabin (*Amer. Jour. Anat.*, 1905, IV, 355-389). If these nodes become invaded it is by a direct extension of the growth. The large number of dark dots in the connective tissue about the cervix and also in the outer cervical wall (see Figs. X, XXII and XXVIII) represent such nodes.

Adhesions from Inflammatory Disease of the Uterine Appendages (Independent of the Cancer).—Adhesions from pelvic inflammatory disease associated with cancer of the uterine cervix,

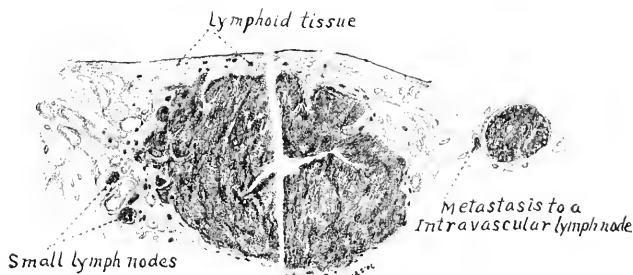


Fig. XXII.—Stained Cross Section of Each Half of Cervix and Parametrium Taken at the Line 1-2, Indicated in Fig. XXI.

Nearly the entire cervix is cancerous, direct extension is shown on the right side and metastasis to intravascular lymph node in the left parametrium which has "held up" the cancer before it reached the large parametrial lymph node. The small dots represent collections of lymphoid tissue apparently not connected with lymph channels.

but independent of it, are of great clinical significance. They not only cause pain, which may wrongly be attributed to the malignant growth, but they may also limit the movements of the uterus and thus make difficult the clinical estimation of the extent of the disease, and furthermore, add greatly to the difficulties of the operation. Pelvic inflammatory disease independent of the cancer was found in eleven of the twenty-seven cases, in fourteen of the other cases the appendages were normal, in another case the inflammatory condition was apparently due to pyosalpinx arising from a pyometra and, indirectly caused by the cancer, while in the last case cancer had developed in the cervical stump

remaining after a previous supravaginal hysterectomy. Of the eleven cases with adhesions from pelvic inflammatory disease, pain was noted as a symptom in eight, and was directly attributable in most of them to the adhesions. In one instance, it was the only symptom complained of and led to the diagnosis of the cancer. Pain was likewise present in five of the fourteen cases where the appendages were normal, and, in two of them, was undoubtedly due to the extensive growth, while in the other

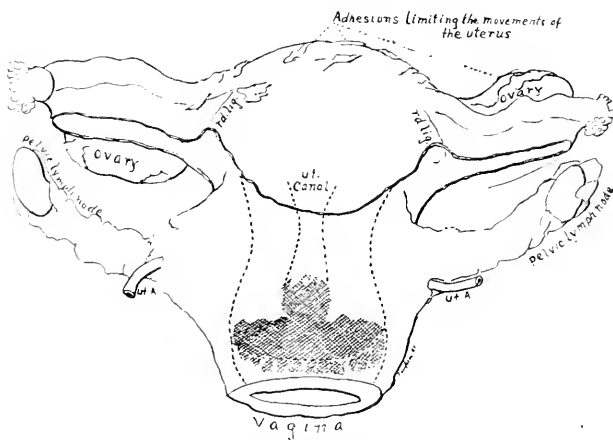


Fig. XXIII.—Adhesions from Pelvic Inflammatory Disease (Independent of Cancer), Limiting the Movements of the Uterus in a Case with a Very Early Primary Growth (*Gyn. Path.* No. 7601).

Patient 37 years old; four children (youngest 9 years). Bloody discharge had been present for five months, and a severe hemorrhage, while straining at stool, occurred three weeks ago. Pain was probably due to adhesions from pelvic inflammatory disease. General condition was excellent. Movements of the uterus were limited by the pelvic adhesions, deceiving one as to the extent of the malignant process and also increasing the difficulties of the operation. Type of growth was squamous-celled carcinoma, vaginal portion of uterine cervix, everted.

Reconstruction of growth in specimen removed, ($\times \frac{1}{2}$), shows a papillary growth arising from the posterior cervical lip and extending up the cervical canal, but limited to the cervix. The adhesions on the fundus of the uterus are shown, which held it in retroflexion.

three its cause was not ascertained. I think we have a right to infer that when cancer of the uterine cervix causes pain it usually indicates that the disease has extended beyond the uterus. On the other hand, when pain is associated with other symptoms of cervical cancer we should examine our cases very carefully in order to ascertain whether or not adhesions from pelvic inflammation are present, for that may be the cause of

the pain and so alter our prognosis in regard to the extent of the growth. In seven of the eleven cases with adhesions from a previous pelvic inflammatory disease, these were extensive and restricted the movements of the uterus and also increased the difficulties of the operation. In Fig. XXIII is shown a very early primary growth, the parametrium and pelvic lymph nodes being apparently free, but adhesions from a previous pelvic inflammatory disease caused pain, limited the movements of the uterus and added to the difficulties of the operation.

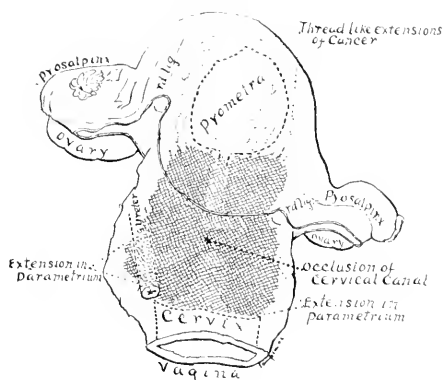


Fig. XXIV.—Adhesions from Pelvic Inflammatory Disease (Pyosalpinx), Secondary to Pyometra, Limiting the Movements of the Uterus. (Gyn. Path. No. 7658).

Patient 63 years old; seven children (44–26 years); menopause sixteen years ago. Bleeding for three months was the only symptom. General condition was excellent, hemoglobin 85 per cent. Movements of uterus were limited by pelvic adhesions from double pyosalpinx, probably secondary to pyometra. Parametria of both sides were indurated.

Reconstruction of growth in specimen removed, ($\times \frac{1}{2}$), shows the primary growth extending beyond the cervix, involving the body of the uterus, *en masse* and as thread-like processes of cancer, causing pyometra from occlusion of the cervical canal and probably causing the bilateral pyosalpinx, which was present.

Adhesions from Inflammatory Disease of the Uterine Appendages Caused by Cancer.—In one instance a pyometra was present and this was associated with double pyosalpinx and a resulting pelvic peritonitis, greatly limiting the movements of the uterus and adding to the difficulties of the operation. This condition is shown in Fig. XXIV.

Indurated Feeling Parametria, in Which Cancer Was Found.—As has been previously stated, cancer invades the parametrium by direct extension either *en masse* or as fine, thread-like processes.

The microscopical examination of the advancing border of the growth presents varying pictures in different cases. In some instances there may be a marked reaction on the part of the surrounding tissue, as shown by the presence of round cells infiltrating the tissue about the advancing growth and giving rise to a marked inflammatory reaction, and hence causing an indurated feeling parametrium. In one instance (Figs. XXV and XXVI) this reaction was made up, almost entirely, of

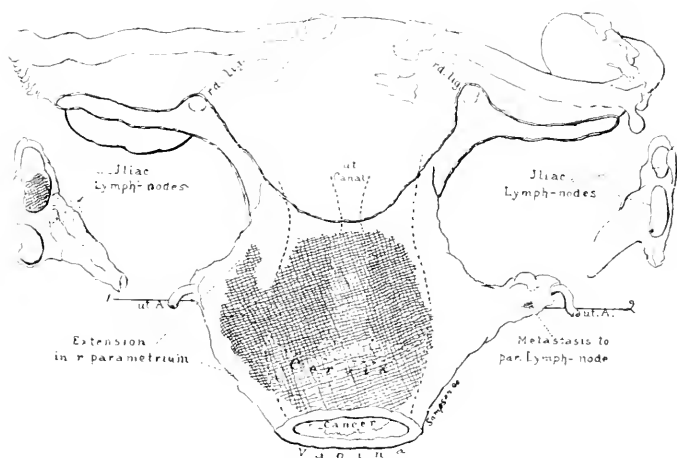


Fig. XXV.—Indurated Feeling Parametrium, with Cancer (*Gyn. Path.* No. 7370).

Patient 35 years old; two children (ages 2). Leucorrheal discharge had been present for six months, and bleeding every time she had sexual intercourse or used a douche. Pain, present for several years, was due to pelvic adhesions from previous inflammatory trouble. General condition was fair, hemoglobin 75 per cent. Uterus was adherent, parametrium on both sides indurated and posterior vaginal wall was involved.

Reconstruction of growth in specimen removed, ($\times \frac{1}{2}$) shows the direct extension of growth into the parametrium and the metastases to parametrial and pelvic lymph nodes.

eosinophiles which accompanied the growth everywhere, *i.e.*, in the uterine tissue, parametrium, so-called vaginal implantations and also in its metastases to the pelvic lymphatics. In still other cases there may be very little evidence of cellular infiltration of the surrounding tissue, but the latter may be greatly thickened, as though attempting to wall off or encapsulate the malignant growth, and possibly this may have been preceded by a stage of cellular infiltration. It causes, however,

an indurated feeling parametrium. In the third class of cases there is very little reaction on the part of the surrounding tissue and hence the parametrium may not feel greatly altered by the presence of the cancer unless it is extensive.

In nearly all of the fourteen instances of direct invasion, the parametrium felt more or less indurated. But, at the same time, the apparent amount of induration present on palpation did not always permit a correct estimation of the degree of involvement, as in some cases it was overestimated and in others underestimated, though I think the former occurs more frequently, *i.e.*, I believe that before or during operation the tissues more often give the impression of being invaded by cancer to a greater extent than is afterwards shown in the pathological laboratory.

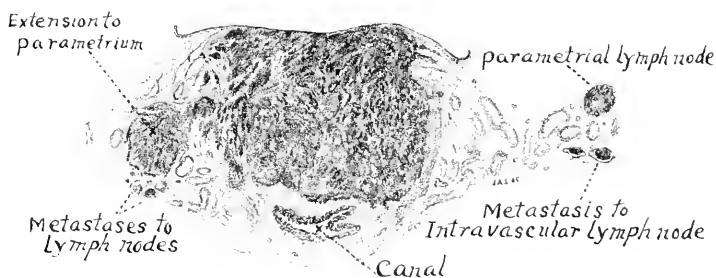


Fig. XXVI.—Stained Cross Section of the Cervix and Parametrium (Slightly Reduced), Taken at the Line 1-2, Indicated in Fig. XXV.

The growth has invaded the posterior cervical wall, the cervical canal and anterior wall being free at this level. The parametrium has been invaded by direct extension and metastases to intravascular lymph nodes.

On the other hand, the reverse may be the case, which is especially true for the metastases to the parametrium.

Indurated Feeling Parametrium in which Cancer Was Not Found.—In one case the parametrium felt indurated but cancer was not found in it. (Figs. XXVII and XXVIII.) It was clinically cancerous but microscopically free. This induration was caused by a marked thickening of the connective tissue of the parametrium without any cellular reaction. The uterine appendages of this case were adherent but the adhesions were very few in number and light.

Normal Feeling Parametrium in which Cancer Was Found.—In three instances metastases were present in the lymph struc-

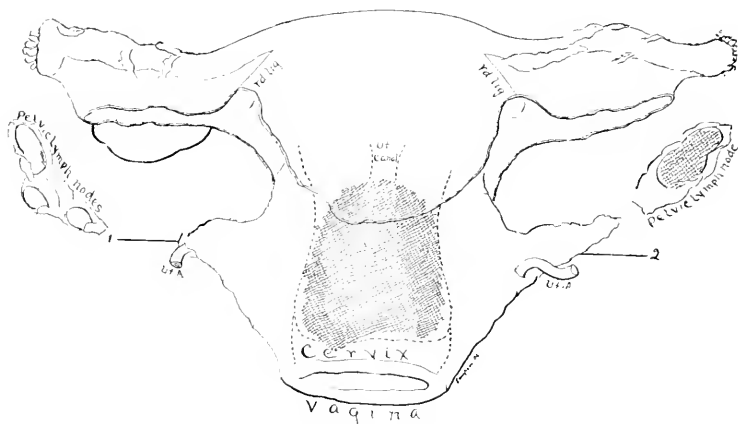


Fig. XXVII.—Indurated Feeling Parametrium in which Cancer was not Found (*Gyn. Path.* No. 6860).

Patient 48 years old; eight children (ages ?); still menstruating. Bleeding had been of eighteen months duration, foul, watery discharge of shorter duration and some pain possibly due to adhesions from a previous pelvic inflammation. A uterine polyp may have accounted for some of the bleeding. Condition was fairly good, hemoglobin 80 per cent. Movements of uterus were restricted and parametrium of both sides felt indurated. Type of growth was squamous-celled carcinoma, cervical canal, inverting.

Reconstruction of growth in specimen removed, ($\times \frac{1}{2}$), shows the growth about to extend into the parametrium, but the latter free. metastases were present in the pelvic lymph nodes of each side.

Indurated parametrium, Cancer not present

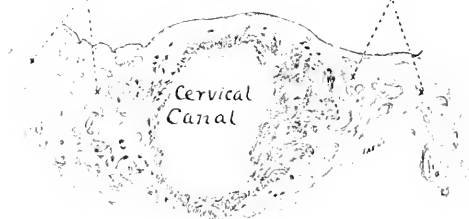


Fig. XXVIII.—Stained Cross Section of the Cervix and Parametrium (Slightly Reduced), Taken at the Line 1-2, Indicated in Fig. XXVII.

The growth is still limited to the cervix; the center of the growth had been necrotic and had sloughed away. The parametrial connective tissue is greatly thickened and there are present many new formed collections of lymphoid tissue (dark dots) about the periphery of the growth, apparently without any connection with the lymph channels.

tures of the parametrium without there being any evidence of a direct extension of the growth into that tissue. In all three cases the parametrium felt normal or only slightly indurated, and there was very little or no reaction on the part of the tissue about the cancerous lymph nodes. These nodes varied in size, the two smaller ones having a diameter of about 2 mm. and the large one was bean-shaped with a long diameter of about 5 mm. Figs. XXIX and XXX illustrate the latter case and the other two cases have already been shown in Figs. XV, XVI, XIX and XX.

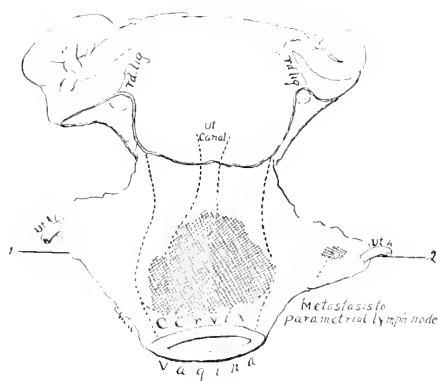


Fig. XXIX.—Normal Feeling Parametrium Containing Cancer (*Gyn. Path. No. 6284*).

Patient 49 years old; no children; menopause three years ago. No bleeding, but a foul discharge had been present for three months. Slight pain was possibly due to adhesions from pelvic inflammatory disease. General condition was excellent, hemoglobin 80 per cent. Uterus freely movable, parametrium felt normal. Type of growth, squamous-celled carcinoma, vaginal portion of the cervix, everting (cauliflower mass removed at previous curettage).

Reconstruction of growth within the specimen removed, ($\times \frac{1}{2}$), shows a primary growth limited to the cervix, but a metastasis is present in a lymph node of the parametrium, which was not palpated.

Metastases of Cancer of the Uterine Cervix to the Pelvic Lymphatics.—Cancer was found in nine out of nineteen specimens studied. The percentage may have been higher, for the nodes, removed at operation, were only the accessible ones along the iliac vessels and sides of the pelvis. Accordingly it is not only possible but probable that other nodes than those removed may have contained cancer. Baisch concludes, after carefully considering all facts, that the pelvic lymph nodes are involved

in about one-third of the operable cases of cancer of the uterine cervix, which becomes increased to one-half if only those cases are considered in which the parametrium is involved.

We all realize that there is no relation between the size of the primary growth and the presence or absence of cancer in the pelvic lymph nodes; the primary growth may be small and yet metastases may have occurred to the pelvic lymph nodes as already shown in Fig. V. This is very unfortunate, for we can never tell clinically whether or not metastasis has taken place. Furthermore, a large pelvic lymph node is not necessarily cancerous (see nodes in Fig. VII) and a small node does not exclude cancer (see nodes in Fig. XIII). Accordingly it is only by the use of the microscope that we can positively exclude the existence of cancer in the pelvic lymph nodes. On the other hand,

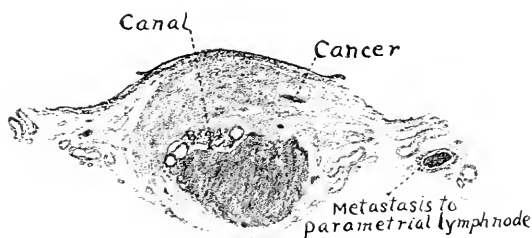


Fig. XXX.—Stained Cross Section of the Cervix and Parametrium (Slightly Reduced), Taken at the Line 1-2, Indicated in Fig. XXIX.

Primary growth is limited to the cervix, involving the anterior cervical wall and including a portion of the cervical canal. The metastasis in the left parametrium is shown which was not palpated before operation.

the primary growth may be extensive and yet the disease may still be local and the pelvic lymph nodes free (see Fig. VII). I think that we may conclude that, in at least forty per cent. of the extensive cases, the disease has not yet metastasized. This is very fortunate, for it means that an extensive local operation without removal of the pelvic lymph nodes may cure even some of the cases which are usually considered hopeless.

Is the removal of the pelvic lymphatics of any curative value? We realize that it is impossible to remove, operatively, all of the pelvic lymphatics. We can remove the easily accessible pelvic lymphatics, and undoubtedly they are usually the first to be involved by cancer, and in some cases the only ones; but if this is done as a routine procedure it lengthens the operation

and therefore increases the primary mortality, and this may more than offset the gain in the percentage of cures caused by their removal, for we must admit that, after the growth has metastasized, the chances for a cure have been greatly diminished, no matter how thorough the operation.

Wertheim made the following statement in his report before the Seventy-third Annual Meeting of the British Medical Association held in July, 1905 (*British Med. Jour.*, Sept. 25, 1905, 694): "No decisive opinion can yet be given as to the value of extirpation of glands, but in the majority of cases in which cancerous lymphatic glands have been removed there has been a recurrence of the disease. Some of the cases, indeed, are free from recurrence after three to three and a-half years, and I have had some tables prepared to demonstrate to you the circumstances. However that may be, it is certain that the superiority of the abdominal operation depends principally not on extirpation of glands, but on the complete removal of the cancerous uterus, that is to say, on the possibility of operating in severe cases, and at the same time of removing more of the tissue of the parametrium."

Ries (*Surg. Gyn. and Obst.*, 1905, 1, 280-282) still adheres to the routine dissection of the pelvis with removal of the pelvic lymphatics, and says, "every step back from the minimum requirements, which I stated ten years ago, may be expected to increase the ratio of recurrences." Baisch also thinks that with our present knowledge it would be irrational to give up the removal of the pelvic lymphatics. Clark, who was one of the first to advocate their removal, states (*Progressive Medicine*, 1905, 152) "my own conclusion, therefore, although very reluctantly reached, is that we lose more than we gain in the radical operation when the glands are painstakingly extirpated, and to remove here and there a palpable enlarged gland, will certainly not promote the patient's interest so far as a radical cure is concerned. My own rule, therefore, is to remove one or more glands, if they are palpably enlarged, for microscopic examination. If metastasis is found, the prognosis is inevitably bad."

The experiences at the Johns Hopkins Hospital accord with that of Wertheim, *i.e.* the growth has usually recurred when cancer has been found in the pelvic lymph nodes. In two of my own cases, however, nearly three years have elapsed since

the operation and both patients are now apparently free from any evidence of the disease, although cancer was found in the pelvic lymph nodes removed at operation. My plan, at present, is not to attempt to remove the pelvic lymph nodes unless I find at the close of the operation that it can be done without apparently increasing the primary mortality.

CONCLUSIONS.

I. I was able to demonstrate cancer either in the parametrium, the pelvic lymph nodes or both, in twenty out of twenty-seven specimens studied, and furthermore the pelvic lymph nodes were not removed in three of the seven cases where the growth was apparently local, thus suggesting that it may not have been local in all of these three cases. In three of the ten specimens where cancer was not found in the parametrium, it was found in the pelvic lymph nodes, *i.e.* a small primary growth had metastasized to the pelvic lymph nodes without apparently infecting the parametrium through which it had passed.

II. The parametrium was found involved in seventeen instances; eight times by direct extension alone, either *en masse* or in the form of thread-like processes frequently along the lymph channels or in the nerve sheaths; three times by metastases in the lymph structures of the parametrium without any evidence of a direct extension of the disease beyond the cervix; and in six cases both forms of invasion were present.

III. In the nine instances of metastases in the parametrium, the lymph nodes were involved in all but one case and in only one case was the metastasis apparently in a lymph channel, and here faulty technique makes this observation untrustworthy. Of great interest is the possibility of the new formation of minute lymph nodes which project into the lymph channels like sponges, and to which the cancer may metastasize.

IV. Adhesions, from pelvic inflammatory disease, independent of the cancer, may make the cancer appear more advanced than it is, by causing pain which we may wrongly attribute to the cancer. If pain is caused by the latter it is usually a manifestation of an advanced growth. The pelvic adhesions may also limit the movements of the uterus which may also be wrongly attributed to the cancer and thus they may also increase the difficulties of the operation.

V. The presence of a direct extension of the disease into the parametrium is usually accompanied by a reaction on the part of the surrounding tissue, which manifests itself by a cellular infiltration or hypertrophy of this tissue, thus causing induration in addition to that which may be caused by the cancer. The presence of this induration and its amount varies greatly in different cases, so that the hard or soft feeling of the parametrium affords no definite evidence of the presence or absence of cancer in that tissue or the extent of the process.

VI. The parametrium may feel indurated and yet show no evidence of cancer in it. In one of these cases there was a marked hypertrophy of the connective tissue causing the induration; the etiology of which was not ascertained.

VII. A parametrium, as stated, may feel normal and yet contain cancer, occasionally as thread-like extension but probably more often as metastases. It is remarkable how little the presence of cancer cells in the lymph nodes, previously described, alters these nodes or affects the surrounding tissue so that it may be clinically suspected. *Only by the microscope can one exclude cancer from the parametrium.*

VIII. The pelvic lymph nodes are involved in from one-third to one-half of the operable cases and only by the microscope can we definitely tell whether they are cancerous or not. The primary growth may be limited to the cervix and yet it may have metastasized to the pelvic lymph nodes, or the former may be large and the latter nodes free. Theoretically, we should remove the pelvic lymph nodes in every instance, for if this is not done from one-third to one-half of the operable cases will die from cancer left in those nodes. But the question of the curability of these cases and also whether or not the removal of the nodes will so increase the primary mortality as to more than offset the percentage of cures caused by their removal are problems which as yet have not been solved.

IX. A wide excision of the parametrium, however, is demanded; first because it is so frequently involved, seventeen of twenty-seven cases, and secondly because the growth is local in from one-half to two-thirds of the operable cases and probably even in forty per cent. of the extensive ones. We must also remember that only by the microscope can we definitely determine its existence or its extent.

X. In probably half of the cases of cervical cancer, seen at

the present time, there has been a history of neglected uterine bleeding for over six months; this was true of the twenty-seven cases reported here. When we realize that its clinical course is usually rapid, the patient rarely living over three years, and about three-quarters of them dying within two years and one-third within one year after the first manifestation of the disease, we can see how important an early diagnosis is and also how important it is that the patient should be operated upon as soon as possible after it is made. A short period of neglected uterine bleeding or other symptoms referable to uterine trouble, may permit the growth to extend so far that the disease becomes incurable.

We have seen that in some cases the parametrium has been unable, even temporarily, to check the extension of the disease; but in other cases this has been accomplished by the reaction on the part of the connective tissue and also by lymph nodes which are normally there and possibly others which may be newly formed and projecting into the lumen of the lymph vessels prevent the cancer cells from passing them, so that in at least forty to fifty per cent. of the cases in which the parametrium is involved, its structures have been able to temporarily check the progress of the disease. Should we not come to their assistance before it is too late? How may this be accomplished? The answer is by the "prophylaxis of the incurable condition." As yet we do not know how to prevent the disease, but all do or should realize that it is curable in a large percentage of the cases if the operation is undertaken upon the first appearance of symptoms, and it is this knowledge that we should diffuse among the profession and especially among the women of this country, for whose welfare we are directly responsible.

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URETHRAL BACTERIA AS A FACTOR IN THE ETIOLOGY OF CYSTITIS IN WOMEN.*

BY

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(With one illustration.)

IN discussing the etiology of cystitis in women, we must distinguish three main channels of infection, one, by way of the ureters, a second, directly through the bladder wall from some of the surrounding structures, vagina, rectum, ovary, tube, uterus, and the third from below by way of the urethra. Of these three, by far the most frequent route of infection is the last named, the urethral. In general we may say the ureter acts merely as a channel to carry infectious germs such as tubercle or typhoid bacilli from the kidneys to the bladder. The ureters themselves are normally free from germs and are rarely the primary source of the infectious material. Likewise the bladder wall is seldom a primary seat of infection, but is only secondarily penetrated by suppurative processes such as pyosalpinx, etc., or by the invasion of colon bacilli from the rectum. How does this rule apply to the third channel of infection, the urethra? Are we to consider in this case also that the germs are merely carried from the outside through the urethra into the bladder. Are we to hold responsible the germs left in the catheter by insufficient sterilization and the accidental contamination of such an instrument by the hands of the nurse or the vulva of the patient? or are we to blame in this instance the presence of pathogenic germs residing in the urethra, which, spontaneously or by means of some instrument, gain entrance into the bladder? Manifestly the solution of these questions must depend primarily on whether or not bacteria are present in the normal female urethra and whether or not these bacteria are pathogenic.

The bacteriologic examinations made thus far are still rather scanty, so that confirmatory evidence on this point is greatly to be desired. With this object in view I made bacteriologic ex-

*Candidate's Thesis, American Gynecological Society, May, 1906.

aminations of the urethral secretion in fifty women free from any disease of the urinary tract or acute pelvic inflammation. In addition, various tests were made in regard to the manner of catheter infection. The results of the examinations together with the lessons to be drawn therefrom in the way of prophylaxis will be considered later.

For many centuries it was known that under certain pathologic conditions fermentation takes place in the urine deposited in the bladder. The general assumption up to the middle of the nineteenth century was that this fermentative process was purely chemical and was due to pus, mucus, various albuminous substances, and the like. In the year 1859 Pasteur shed new light upon this question. In several classical experiments he showed that the ammoniacal decomposition of the urine is due to the action of bacteria, and that these bacteria are probably carried into the bladder by means of the catheter. His views met with considerable opposition and it was almost thirty years later (1886) before the truth of his observation was corroborated. It was primarily the improvement in bacteriologic technique made by Koch that enabled men like Bummi, Albarran and Halle, Michaelis, Clado and others to isolate from the urine of cystitic patients the ordinary pus-producing micro-organisms.

Cystitis having been shown to be of bacterial origin, it remained to determine next the source of these bacteria. Pasteur thought that the bacteria were derived from the air. Others had supposed that they resided in the catheter. Rovsing first called attention to the bacteria of the urethra as a possible source of infection. In his book "*Die Blasenentzündungen und ihre Aetiologie*" published in 1890, he reported the results of bacteriologic examinations of the urethra in ten women free from any disease of the urinary tract. In six of these women he found the same bacteria (staphylococci, streptococci) that produce cystitis. Savor a few years later made similar examinations and found the colon bacilli in four out of twelve urethral secretions. He believes that this bacillus is deposited in the urethra by contact with the vulvar secretion, and that it can multiply there even under normal conditions. In 1897 appeared Melchior's excellent monograph on "*Cystitis und Urinfection*." This author made extensive bacteriologic investigations on matters relating to cystitis. In the urethral

secretion he found staphylococci and streptococci but not colon bacilli.

Von Gawronsky examined the urethra of 62 women and in 47 of them (76 per cent.) found no bacteria present. In the remaining 15 women he found staphylococci 9 times, streptococci 3 times, and colon bacilli twice.

In a second more extensive series of examinations, Savor found in 93 gynecologic patients free from gonorrhea, an absence of bacteria in the urethra 34 times. Pathogenic bacteria were found as follows: staphylococcus pyogenes albus, 16 times, staphylococcus pyogenes aureus, 6 times; streptococcus, 4 times, bacillus coli communis, 14 times. He also made a large number of examinations of the urethral secretion in pregnant and puerperal women.

Almost diametrically opposed to Savor's findings were those of Schenck and Austerlitz, who in but 3.4 per cent. of their cases found pathogenic bacteria in the urethra. In later investigations they modified the technique of obtaining the urethral secretion to accord with the method employed by Savor but without appreciable change in their findings.

The bacteria of the male urethra have also been the subject of considerable research. The most recent work, perhaps, is by Pfeiffer in 1904, who found only one case sterile in a total of 24. Secretion taken by means of an endoscope showed bacteria present in the posterior as well as the anterior urethra. Staphylococci were found in 75 per cent. of the cases. Streptococci and colon bacilli were absent. None of the germs were pathogenic for animals.

Finally we come to the work of Baisch and Piltz. Baisch found staphylococci invariably present in the urethra of thirty out-clinic patients. In two-thirds of these patients the colon bacillus was also found. In post-operative cases confined to bed he found that every urethra after the third day contained both staphylococci and colon bacilli. More careful and extensive bacteriologic examinations were made soon afterwards in the same clinic by Piltz. In 50 gynecologic cases he found pathogenic bacteria present in the urethra 24 times. Eighteen times staphylococcus pyogenes albus was found, six times the colon bacillus, once streptococcus pyogenes and once staphylococcus pyogenes aureus. Tests were also made in 25 pregnant and 22 puerperal women as to the presence of pathogenic

bacteria in the urethral and vulvar secretions. He found such bacteria present in the following percentage of cases:

Pregnant women: vulva, 68 per cent., urethra, 32 per cent.

Puerperal women: vulva 100 per cent., urethra, 86 per cent.
as compared with

Gynecological cases: vulva, 88 per cent., urethra, 48 per cent.

It would appear, therefore, that these germs have a tendency to decrease during pregnancy and to undergo a marked increase a few days after delivery. Piltz's results differ from those of Baisch more especially in the frequency with which colon bacilli were found. Although his work was done in the same clinic he found the colon bacillus in the vulva of only 26 per cent. of the puerperal cases (women confined to bed) and in the urethra of only 5.8 per cent. of these women. Among the gynecologic cases the proportion of colon bacilli in the vulva was 70 per cent.; in the urethra it was 18 per cent.

At first glance the findings of these various investigators as shown in Table I, seem hopelessly contradictory. Yet, if we except the work of Schenck-Austerlitz and of Baisch, the results do not seem irreconcilable. The difference can, it seems to me, be explained on one or several of the following grounds:

(1) Difference in the character of the material (ambulatory patients, patients confined to bed, pregnant women, puerperal cases).

(2) Difference in the preliminary preparation of the urethra.

(3) Difference in the quantity of material removed for examination.

(4) Difference in the character of media on which the material was grown.

(5) Difference in the exactness with which individual colonies were studied before their identification was considered complete.

(6) Difference in the conception of what constitutes a pathogenic bacterium.

Under head (1), the examinations of Savor, together with those of Piltz would make it seem more than probable that the number of bacteria present in the normal female urethra becomes lessened in the last months of pregnancy, and that during the puerperium there is a marked increase in their number. This increase may perhaps be due to the fact that these persons are confined to bed. Baisch found that even perfectly healthy women, if confined to bed for several days, showed an increase

TABLE I.

AUTHOR	Number of Cases	Sterile	Patho- genic Bacteria	Staph. Pyog. Albus	Staph. Pyog. Aureus	Strepto- coccus Pyogenes	Bacterium Coli	Other Pathogenic Bacteria
Rovsing.....	10.....	4 = 40%	6 = 60%	.....	2 = 20%	2 = 20%	.....	3 = 30%
Melchior.....	6.....	.....	3 = 50%	3 = 50%	.....	.....	2 = 3.2%	.....
V. Gawronsky.....	62.....	47 = 76%	14 = 22.5%	1 = 1.6%	8 = 12.9%	3 = 4.8%	.....	.....
Savor.....	93 non-pregn't non-gon'h'l cases	34 = 36.5%	40 = 43%	16 = 17.3%	6 = 6.4%	4 = 4.3%	14 = 15%	.....
"	49 non-pregn't nonorth'al cases	6 = 12.2%	38 = 77.5%	10 = 20.4%	5 = 10.2%	2 = 4.1%	6 = 12.2%	5 = 21.7%
"	120 pre-n't cases (200 exam'ns)	72 = 24.8%	108 = 68.3%	142 = 48.0%	7 = 2.4%	22 = 7.5%	25 = 8.6%	2 = 0.7%
"	88 puert'l cases (173 exam'ns)	16 = 5.8%	149 = 86.1%	95 = 54.9%	4 = 2.3%	16 = 9.2%	37 = 71.8%	1 = 0.6%
Schenck & Auschultz	60.....	32 = 52%	2 = 3.3%	.....	.....	.....	1 = 1.6%	1 = 1.6%
"	25 non-pregnant cases	10 = 40%	1 = 4%	.....	.....	.....	.....	1 = 4%
"	25 pregnant cases	13 = 52%	.....	.....	.....	.....	.....	.....
"	50 non-pregnant cases	4 = 8%	2 = 8%	.....	.....	.....	.....	.....
Piltz.....	25 puert'l cases	4 = 8%	24 = 48%	18 = 36%	1 = 2%	1 = 2%	0 = 18%	2 = 8%
"	25 pregnant cases	5 = 20%	8 = 32%	7 = 28%	.....	.....	3 = 12%	.....
"	22 puert'l cases	0 = 0%	19 = 86%	19 = 86%	1 = 4.5%	6 = 27.7%	1 = 4.5%	.....

in the number of pathogenic germs in the urethra. Finally, in patients with acute or chronic gonorrhea, Savor found a decided increase in the number of pathogenic urethral bacteria besides the gonococcus. It is evident, therefore, that each investigator must clearly state the character of cases from which he takes his material.

The preliminary preparation of the patient is of the greatest importance. Savor and Schenck-Austerlitz used a cotton pledget soaked in 1-1000 bichloride solution to cleanse the meatus urinarius. The latter even went so far as to wipe the lower portion of the urethra with a cotton applicator moistened with 1-1000 bichloride and then did not wash away the superfluous antiseptic solution with water. Even where a vigorous effort is made to wash away the traces of the bichloride solution, it seems questionable whether any such tests can be considered as truly reliable, since minute traces of the antiseptic may hinder the growth of bacteria. The argument that Schenck and Austerlitz bring forward to support their view, namely, that out of ten cases of cystitis in which this technique had been employed the same germs found in the bladder occurred eight times in the urethra, is not conclusive. For here we have bacteria multiplying in the presence of a pathologic condition, of stronger growth and hence more resistant to the deleterious action of an antiseptic. The method of Piltz was simply to wipe the meatus urinarius with a piece of sterile cotton before introducing the platinum loop.

And this brings us to the point, perhaps, of greatest importance, the quantity of material removed for examination. Franz has shown in his investigations on the bacteriology of the lochia that the number of positive findings is directly dependent upon the quantity of material inoculated. It certainly would not seem immaterial whether a platinum wire was merely touched to the urethral mucosa or whether a platinum loop was used as a sort of curette to scrape off as much of the urethral secretion as possible. Schenck and Austerlitz used a straight platinum wire, and hence it is not surprising that they had fewer positive results.

The difference in the character of media upon which the material is inoculated is also important. It is evidently a mistake to employ only sterile urine for this purpose as Rovsing did, and to exclude all those cases in which no urine fermentation took

place. Pathogenic bacteria may be present without the occurrence of any such fermentative change. Furthermore Melchior's plan of allowing the first inoculation in broth to remain for seven days in an incubator before making any effort at isolation gives too much opportunity for some contaminating germ to multiply at such a rate as to cloud the results. Aside from these two there was no important difference among investigators in this regard.

It is a matter of considerable weight how long and how carefully the various colonies were studied. The requirements for the identification of the colon bacillus are many, and where the authors, as in Baisch's case, have failed to state on what ground they have termed a certain bacterium the colon bacillus, the surmise cannot be avoided that the identification may have been incomplete. Such an assumption would explain why Baisch found the colon bacillus in two-thirds of his ambulatory patients, while Piltz, working in the same clinic, found it in but 18 per cent. Furthermore it is necessary that the agar plates be studied daily or at least every other day for ten days as Piltz recommends. Every now and then I found a colony making its first appearance a week after inoculation.

Finally the different investigators have different ideas as to what constitutes a pathogenic bacterium. Doubtless animal inoculations are of great importance in determining the virulence of a particular microorganism, but we are hardly justified in refusing to call a microorganism pathogenic, simply because it does not kill one sort of test animal. This, I believe, is one of the reasons why Schenck and Austerlitz report so few pathogenic bacteria.

From the above it is evident that the reports of previous investigators are not as inconsistent as they would seem at first sight. The two men who have most carefully avoided any source of error are Savor and Piltz, and their results are generally in accord. In fixing the choice of a technique for my own work I thought it preferable not to undertake any new method but rather to follow in its essentials the procedure of Piltz.

The women selected were for the greater part gynecologic patients. None of them had any disease of the urinary tract or any acute inflammatory trouble in the pelvis. They were in part private patients, in part patients of the gynecologic clinic of the Washington University Hospital. For permission to use this latter material, I wish to express my thanks to Dr. H. S. Cressen.

The patient was put on the table with thighs separated and while an assistant pulled apart the labia, the urethral meatus was dried with a piece of sterile cotton and a platinum loop passed into the urethra, special care being taken to avoid contact with the edge of the meatus. The loop was passed in about $\frac{1}{2}$ cm. and gently rubbed against the walls of the urethra in various directions. The material thus obtained was inoculated upon fluid agar and poured into a Petrie dish.

In a few cases the specimen was taken through a urethral bivalve speculum in order to avoid contact with the external meatus. There was no appreciable difference in the results. Williams' investigations on vaginal bacteria in pregnancy clearly show how impossible it is to introduce a speculum without carrying into the deeper portions germs from the outside. What applies to the vagina, must, it seems to me, apply with double force to the urethra. The narrow lumen of this canal hardly permits the satisfactory use of a speculum for this purpose. An apparatus similar to the Menge tube would likewise be out of place in the urethra, both because of the size of the meatus and because of the scantiness of the secretion.

The agar plates already referred to were put in an incubator at 37° C. and studied after twenty-four hours, and at least every other day for ten days. Wherever the colonies were not too numerous they were numbered and the morphology, motility, and staining properties of their constituent bacteria studied. If there was anything suspicious of *staphylococcus pyogenes albus*, *staphylococcus pyogenes aureus*, *streptococcus pyogenes* or the colon bacillus, further inoculations were made. Investigations were restricted to these bacteria because they are the organisms that are almost exclusively to be found in the catheter cystitis of women (Brown, Baisch) and because the identification of all germs would have been a Herculean task.

If there appeared upon the agar plates colonies resembling those of celi, composed of short feebly motile, Gram-negative bacilli, inoculations were made on litmus milk, on Dunham's peptone or broth, and upon neutral-red-glucose agar. The last-named medium contained 1.5 per cent. of agar, 0.25 per cent. of glucose, and 1 per cent. of a concentrated aqueous solution of neutral red. The colon bacillus will cause this medium to turn a fluorescent green color, at the same time splitting it up by gas formation. The work of Moore-Revis, Scheffler and Wolff

shows this to be an important test for coli. If the suspected bacillus gave this reaction, formed indol in the broth and coagulated and turned red the litmus milk, it was classed as the bacillus coli communis.

The staphylococcus was recognized by its growth on agar, its morphology and staining qualities, and its liquefaction of gelatin. The streptococcus was recognized by its growth on agar, gelatin, and broth, and its morphology and staining qualities.

No animal inoculations of these bacteria were made, for several reasons. In the first place, those made by previous investigators show pathogenesis to be the rule. In order to be thorough, each pathogenic colony would have to be tried on the three main test animals, the guinea pig, the white mouse and the rabbit. This would have involved a very considerable expense in such a long series of experiments. But above all I desisted from animal inoculations because the source of error is great and because the question of the virulence of a microorganism is not of prime moment in considering this subject. Natvig has shown that on the vulva of pregnant women a streptococcus may be found that possesses very little virulence, but that, under the favorable conditions of the puerperium, may develop into an organism of the most virulent type. If the same microorganism whether it be staphylococcus, streptococcus or colon bacillus, is capable of changing from a nonvirulent to a virulent type under certain favorable conditions of growth, it must, it seems to me, be included among the pathogenic bacteria even if it does not kill the test animal. Post-operative conditions, particularly where there is much bladder traumatism, might readily increase the virulence of comparatively harmless urethral germs introduced into the bladder so as to produce a severe inflammation of that organ.

Of the forty-five patients whose urethral secretion was examined, five were confined to bed, the others were out-clinic cases. As stated, none had any disease of the urinary tract or acute pelvic inflammation. The diagnosis was most often retroversion, early pregnancy, neurasthenia, chronic endometritis, myoma uteri, etc.

On examining the results of these 45 cases as tabulated in Tables II and III it will be seen that in 25 of the out-clinic patients (62.5 per cent.) pathogenic germs were found. These bacteria

TABLE II

NUMBER OF CASE	Age	Children	Disease	Size of Urethra	Number of Colonies	Staphylococci	Streptococcus	Bacillus Coli Communis	Other Bacteria	Sterile
1. Mrs. M.	36	?	Pruritus Vulvae...	Medium	2			+		
2. Mrs. K.	29	?	Neurasthenia...	Small	Numerous.					+
3. Mrs. C.	35	1	Parametritis...	Large	Many					
4. Mrs. W.	37	3	Endometritis...	Large	4					
5. Mrs. M.	24	?	Salpingitis Chr...	Large	2	+				
6. Mrs. K.	67	?	Total Prolapse...	Large	15					
7. Mrs. L.	25	?	Parametritis...	Small	1					
8. Mrs. S.	47	?	Retroversion...	Medium	Numerous.					
9. Mrs. P.	35	?	Endometritis...	Large	Numerous.					
10. Mrs. D.	44	3	Pregnancy...	Small	Numerous.					
11. Miss S.	25	0	Tubal Pregnancy.	Medium	Numerous.					
12. Mrs. G.	29	3	Cystocele...	Large	Numerous.					
13. Mrs. H.	46	7	Retroversion...	Large	Numerous.					
14. Mrs. J.	33	5	Tubal Pregnancy.	Large	A few.					
15. Mrs. B.	34	3	Myoma...	Small	A few.					
16. Mrs. Y.	22	1	Retroversion...	Small	A few.					
17. Mrs. S.	47	?	Pregnancy...	Small	A few.					
18. Mrs. P.	20	0	Parametritis...	Small	A few.					
19. Miss D.	27	0	Endometritis...	Small	6					
20. Miss W.	18	0	Pregnancy...	Small	1					
21. Mrs. W.	20	0	Parametritis...	Small						
22. Miss Wm.	16	0	Menopause...	Very large						
23. Mrs. K.	46	7	Retroversion...	Small		+				
24. Mrs. L.	24	0	Retroversion...	Large		+				
25. Mrs. S.	30	1	Retroversion...	Small						
26. Miss Th.	25	0	Parametritis...	Small						
27. Mrs. Sh.	29	0	Endocervicitis...	Small						
28. Mrs. L.	23	0	Pregnancy...	Medium						
29. Mrs. W.	20	1	Neurasthenia...	Large						
30. Mrs. J.	31	0	Parametritis...	Small						
31. Miss J.	23	?	Total Prolapse...	Medium						
32. Mrs. Pa.	35	?	Endometritis...	Large						
33. Mrs. S.	51	3	Lacerated Perium	Small						
34. Mrs. W.	37	4	Parametritis...	Small						
35. Mrs. Z.	26	?	Endometritis...	Medium						
36. Miss D.	27	?	Parametritis...	Small						
37. Mrs. G.	29	?	Endometritis...	Medium						
38. Mrs. F.	23	1	Neurasthenia...	Very large						
39. Mrs. P.	57	1	Retroversion...	Small						
40. Mrs. H.	30	1	Retroversion...	Small						

TABLE III.

POST-OPERATIVE CASES.

No. of Case	Age	Children	Disease and Operation	No. of Days After Operation	Number of Colonies	Urethra	Staphylococcus	Streptococcus	Bacillus Coli Communis	Other Bacteria	Sterile
1. Mrs. Ma....	20	0	Endometritis; Curettement....	7	19	Small.....	+	.....	.....	+	.....
2. Mrs. H.....	30	1	Retroversion; Ventrosuspension.	17	8	.....	+	.....	.....	+	.....
3. Mrs. F.....	32	0	Fibroid; Hysterectomy.	2	5	Large.....	.....	.....	+	+	.....
4. Mrs. Gr....	28	3	Tubal Gestation; Salpingectomy.	20	.....	Medium.....	.....	.....	.....	.....	+
5. Mrs. Oh....	20	0	Endometritis; Curettement....	18	Numerous..	Small.....	+	.....	.....	+	.....

were staphylococcus pyogenes albus, 23 times (57.5 per cent.), staphylococcus pyogenes aureus once (2.5 per cent.), streptococcus pyogenes two times (5 per cent.), bacterium coli two times (5 per cent.). In 17 cases (42.5 per cent.) various other bacteria and fungi developed, non-liquefying micrococci, Gram-positive bacilli, and the like. Seven times (17.5 per cent.) the cultures remained sterile. Of the five bed patients, four had pathogenic germs in their urethra. Three times staphylococcus pyogenes albus was found and once the colon bacillus. Four times other bacteria were also found and only once was the urethral secretion sterile. The following table will give a clear picture of these results:

TABLE IV.

NO. OF CASES	Patho- genic Bacteria	Staph. p Alb.	Staph. p Aur.	Coli	Strepto- cocci	Other Bac- teria	Sterile
40 out-clinic patients.	25 (62.5%)	23 (57.5%)	1 (2.5%)	2 (5%)	0 (5%)	17 (42.5%)	7 (17.5%)
5 bed patients.	4 (80%)	3 (60%)	.....	1 (20%)	.....	4 (80%)	1 (20%)

A further analysis of Table II shows that pathogenic germs were found more often in the small urethra of nulliparous women under 30, and less often in the larger urethra of multiparous women over 30 years of age. This may be due to the greater moisture of the external genitals where the parts are more closely approximated, as in the nulliparous women. Such an assumption would seem to be supported by the fact that in both cases of complete prolapse examined, the urethra was found free from bacteria.

Comparing my results with those of Piltz no such decided difference is seen as not to be readily explicable by the comparatively small number of examinations made. Approximately five hundred patients have been examined by Savor, Piltz, and myself. Our results show that in about one-half of all patients not confined to bed the urethra contains pathogenic germs, and that of these germs the staphylococcus pyogenes albus is the most frequent. Piltz has shown that the colon bacillus is the most variable of these bacteria, being often found on one examination and then not in any subsequent ones. Hence the difference in results on this point is not surprising. The small

number of streptococci found by both Piltz and myself may perhaps be explained by the fact that only solid media were used for inoculation.

As Walthard, Gönner, Bumm, and others have pointed out, such media are less favorable for the development of streptococci than bouillon. This drawback, however, is more than counter-balanced by the increased risk of contamination where fluid media are used (Krönig).

It seems more than likely, therefore, that in a certain percentage of cases the catheter passing through the urethra would be bound to carry pathogenic germs into the bladder. There is considerable evidence to corroborate such a view. Out of thirteen women suffering from a catheter cystitis, after operation, Savor found in ten instances the same microorganisms in the cystitic urine that had been isolated before operation in the urethra. Rovsing, likewise, found in six cases the same germs in the urethra and bladder after catheterization.

To elucidate this point, I made eight tests in the following manner. The urethral secretion was obtained in the usual way. Then a sterilized catheter was introduced into the bladder and the first 10 c.c. caught in a sterile test-tube. A portion of the urine was inoculated on agar plates, and in a number of cases also upon broth. Table V shows the results of these examinations:

In six out of eight cases the bacteria found in the urine were identical with those found in the urethra. In the two remaining cases both urine and urethra were sterile. The assumption, therefore, that if there be pathogenic bacteria in the urethra, these are of necessity carried by the catheter into the bladder, is confirmed by actual bacteriologic tests.

Urethral germs, it would seem, may occasionally ascend into the bladder spontaneously, without the assistance of the catheter. Raymond found the colon bacillus in the urine of seven cases of cystitis in which no catheterization had taken place. Baisch, who also saw cases of spontaneous infection, favors this view as against a migration of germs from the rectum into the bladder. It is difficult to draw any positive conclusions regarding these cases of spontaneous infection.

Piltz quotes me as saying that post-operative cystitis is due to migration of bacteria from the rectum through the bladder wall into the vagina. I certainly made no such statement. The

TABLE V.

No. of Case	Age	Children	Urethra	Bacteria in Urethra	Bacteria in Urine (Agar)	Bacteria in Urine (Broth)
1. Miss Th.....	25	0	Small.....	Staphylococci and Streptococci.....	Staphylococci and Streptococci.....	Staphylococci.....
2. Mrs. J.....	34	4	Large.....	Staphylococci and Streptococci.....	Staphylococci and Streptococci.....	Staphylococci.....
3. Mrs. K.....	67	7	Large.....	Staphylococci.....	Staphylococci.....	Staphylococci.....
4. Mrs. Ha.....	46	7	Large.....	Staphylococci.....	Staphylococci.....	Staphylococci.....
5. Mrs. Jo.....	33	5	.....	Staphylococci.....	Staphylococci.....	Staphylococci.....
6. Mrs. Str.....	47	2	Small.....	Staphylococci and a gram. neg. bacillus.....	Staphylococci.....	Staphylococci.....
7. Mrs. Ko.....	49	7	Large.....	.....	Gram. neg. bacilli, not coll.....	.....
8. Mrs. Sh.....	29	0	Small.....	Staphylococci.....	Staphylococci.....	Staphylococci.....

emphasis was always laid on catheter infection. I only offered it as a possible explanation of these cases of spontaneous infection. While still upholding the possibility of such a mode of infection, my own more recent investigations, together with the work of Baisch and Piltz, make a spontaneous infection from germs in the urethra seem a less circuitous explanation of these cases.

After this consideration of the frequency with which pathogenic germs are found in the female urethra and the manner in which they may gain admittance to the bladder, there still remains the discussion of the prophylactic measures that may be taken in order to decrease the risk of infection where catheterization becomes necessary. I have treated this subject at some length in a previous article (*Post-operative Cystitis in Women: Cause and Prevention, Surg., Gyn. and Obst.*, Feb., 1906) and wish here to take up only such points as were not considered at that time.

The two important things to guard against in the prevention of cystitis are of course trauma and infection. Under the head of trauma I wish only to mention in passing the special catheter recently devised by Gersuny (*Zent. f. Gyn.*, No. 4, 1906). It is of hard rubber with a small lumen, has no side openings, and has a circular guard to prevent its introduction too deeply into the bladder. Gersuny believes that it lessens the risk of traumatism, and thus also of cystitis, and sees a support for his contentions in the fact that only one case in thirty-five developed a cystitis after its employment. Looking over his list I find that only one of these thirty-five patients had to be catheterized more than fifteen times, or counting an average of three catheterizations to the day, longer than five days. This is no better than the results obtained with the ordinary glass catheter. Furthermore, there is strong evidence against the assumption that the trauma in cases of cystitis is produced by the catheter. Post-operative cystoscopic examinations of the bladder by Stoeckel and Kolischer show that ordinarily the trauma is not about the margin of the internal sphincter, but lies about the ureteric openings or in the *bas fond* and is dependent upon operative manipulations or interference with the blood supply. I cannot see that Gersuny's catheter offers much hope for improved results in post-operative cystitis.

The prophylaxis of infection I shall here consider only in relation to urethral bacteria. Is there any way to avoid carrying these germs, many of which are pathogenic, into the bladder?

To a certain extent the flow of urine itself cleanses the urethra. Baisch found that, in patients who were confined to bed and were allowed to urinate only twice in twenty-four hours, the urethra after five days invariably contained colon bacilli. The multiplication of urethral bacteria can therefore be partly prevented by increasing the number of urinations and the total quantity of urine.

Melchior made the following tests to see whether the urethra could be cleansed. He disinfected the meatus with a 3 per cent. carbolic acid solution, introduced a sterilized catheter and collected the last portion of the urine in the bladder. In 9 patients (6 men, 3 women) so examined, the urine was never found to be sterile. Where, however, previous to the introduction of the catheter the urethra was irrigated ten times with a boric acid solution, he obtained in 7 cases (4 men, 3 women) a urine free from all bacteria. These cases of Melchior were apparently all ambulatory patients, at any rate there is no record whether the urethra in these cases contained many or few germs before the irrigation. We know that the number of urethral bacteria is much greater in bed-ridden patients than in ambulatory cases, so it is very questionable whether in post-operative cases these urethral irrigations would be sufficient. At my suggestion such boric acid urethral irrigations were tried before each catheterization in several cases at Wertheim's hospital in Vienna, but did not suffice to prevent infection. All of these cases had, however, been operated on for uterine cancer by the radical method, the vesical trauma was hence considerable, and even a very few germs might have sufficed to produce an infection.

In order to see to what extent such an irrigation would free the urethra from bacteria, I made the following tests in three cases. The urethra was irrigated several times with sterile water. Then a drop of a gelatin prodigiosus culture containing (as counts from the diluted material showed) approximately 1,000,000 bacilli, was carried by means of a platinum loop into the urethra and smeared over its surface for a distance of 2 to 2½ cm. By means of a glass syringe the urethra was now washed out fifteen or twenty times with sterile water (a total of 150 c.c. being used). Then after drying the meatus with cotton, the platinum loop was again passed into the urethra, and cultures were made from the material obtained. In each of the three cases, prodigiosus colonies developed in considerable number, there being respectively 19, 21 and 12 colonies at the end of two days. It would

seem, therefore, that where the number of bacteria is large, a urethral irrigation, even if prolonged, is not a sufficient protection.

In view of the difficulty of properly cleansing the urethra it naturally suggested itself to search for some means such as a shield that would prevent the catheter from coming in contact with the urethra. The first of these so-called "double catheters" was devised by Melchior. His shield consisted of a plain glass tube of somewhat large size, over whose end was fastened a thin rubber film. This was introduced with the usual precautions up to the internal sphincter and a glass catheter of small bore introduced through it, perforating the film and entering the bladder. The urine obtained by its use was found to contain fewer germs, but was not sterile. Melchior confesses that some germs are doubtless deposited on the rubber film in introducing the shield and transported by the catheter into the bladder.

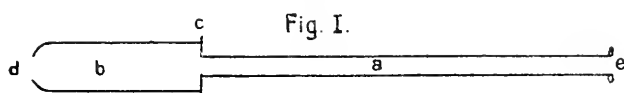


Fig. II.

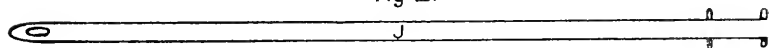
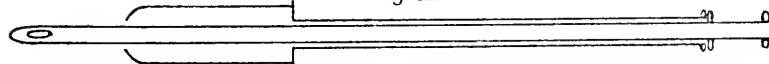


Fig. III.



Cross-section of the Latest Model Rosenstein Double Catheter (half size).
A, inner catheter; B, urethral shield; C, catheter and shield put together.

The double catheter of Rosenstein (see illustration) is in some ways a more practical instrument for this purpose. In answer to the *a priori* objections I made on a previous occasion (large caliber, danger of trauma, insufficient protection against infection) Rosenstein very truly says that I should not criticise without giving the instrument a trial. I have now used the Rosenstein double catheter in some fifteen to twenty cases, and as a result of bacteriologic examinations made in a number of them have come to the conclusion that my original assumptions were correct. In the first place I found several times that the shield was too large to permit of its introduction without considerable pain. The sharp edge of the shield in these cases is

apt to cause traumatism. In two patients a slight bleeding resulted, in spite of the greatest care in its introduction.

As proof that his catheter prevents infection Rosenstein submits as evidence his clinical experience. In but one out of thirty-four cases where repeated catheterization was done with his instrument did an infection follow. Yet in but a small proportion of these cases was there any operative trauma to the bladder, and only seven times was catheterization prolonged over five days, so his results are hardly conclusive.

To see how great a protection against urethral bacteria was obtained by this instrument the following tests were made: A small quantity of a fresh agar culture of bacillus prodigiosus (selected because of its harmlessness and characteristic red-colored growth) was mixed with 10 c.c. of sterile bouillon and three loops of this dilution were introduced into the urethra. The Rosenstein catheter was then passed into the bladder and 5 to 10 c.c. of the urine were removed for examination. Agar plates were inoculated with this urine. As the control of the number of bacteria originally introduced, plates were inoculated at the same time with three loops of the same prodigiosus dilution. Table VI shows the results of these tests. In cases 7 and 8 a single loop of a liquefied gelatin prodigiosus culture was used.

TABLE VI.

NUMBER OF CASE	Number of Prodigiosus Colonies on Control Plates	Number of Prodigiosus Colonies in 5-10 c.c. of Urine Obtained With Rosenstein Catheter
1. Mrs. De.....	32,000	42
2. Miss Di.....	20,000	6
3. Mrs. O'P.....	120	7
4. Mrs. Su.....	30,000	3
5. Mrs. Fi.....	3,000	7
6. Mrs. Ing.....	3,000	1
7. Mrs. Bu.....	1,000,000	80
8. Miss Pe.....	1,000,000	05

It seems likely from these tests that the Rosenstein catheter reduces the number of germs introduced into the bladder; but it is far from providing us with a means of sterile catheterization. The same objections that apply to Melchior's instrument, apply likewise to it. No shield devised on the principle of a speculum can prevent the transplantation of germs first from the meatus to the end of the shield and then from the end of the shield by means of the catheter into the bladder.

One sort of shield that suggested itself to me and one that would not be open to these objections is an inverted rubber cylinder that would unfold itself over the walls of the urethra as the catheter was introduced. In this case there would be no pushing inward, but simply an inverting of the shield. The technical difficulties in the construction of such an instrument for such a narrow canal as the urethra have, however, deterred me from putting this idea to practical use.

Until some more practical form of double catheter has been devised I believe we should hold to the ordinary glass form. It seems inevitable therefore that in a considerable percentage of all cases, greater where the patients are confined to bed, germs will be carried by the catheter into the bladder. If these germs happen to be of a pathogenic variety and the resistance of the bladder is lessened through trauma or congestion, we may have an infection resulting.

Complete asepsis being impossible, we must finally resort to such antiseptics as will not prove too irritating. Ordinarily, this will hardly be necessary for a single catheterization. But where a patient after operation or confinement is unable to void urine spontaneously for a considerable length of time it is certainly advisable to use boric acid irrigations after each catheterization, as suggested by Baisch, to counteract the effect of the germs that may have been deposited in the bladder. Such drugs as cause the formation of formaldehyde in the urine likewise have a marked bactericidal effect (Wannier, Sachs, Schumburg), and should be administered in all these cases.

The relationship of urethral bacteria to the production of catheter cystitis in women may be summarized in the following paragraphs:

(1) The normal urethra free of disease is sterile in only a small proportion of cases. In my series, out of 45 cases it was sterile 8 times.

(2) In about half of the total number of urethrae examined, pathogenic germs are present. The percentage in my series was as high as 62.5 per cent.

(3) Of the pathogenic bacteria found, staphylococcus pyogenes albus is the most common. The occurrence of the colon bacillus seems very variable. It is found frequently where patients are confined to bed. In my series it was isolated only three times.

(4) That these urethral bacteria are actually carried into the

bladder by catheterization is shown in eight examinations in which the urethral secretion and the urine obtained by catheterization were compared. In six cases the bacterial findings were identical, and in the other two cases the difference was a slight one.

(5) Irrigation of the urethra with boric acid removes a large proportion of the urethral bacteria, but where the number is great, does not suffice to remove all.

(6) The double catheters devised for the purpose of avoiding contamination with the urethral bacteria do not as yet deserve to be generally used. Tests made with the instrument of Rosenstein show that its protection is only a partial one. It has other objections, so that ordinarily the usual glass catheter is preferable.

(7) Wherever repeated catheterization becomes necessary therefore, we should advise certain precautions to prevent an infection of the bladder by urethral bacteria. Give urotropin or an allied product internally. Catheterize in the following way: Introduce the ordinary glass catheter part-way into the urethra and irrigate the urethra with half a pint of boric-acid solution, taking care that the fluid does not enter the bladder. Now pass the catheter into the bladder, empty the urine and irrigate the bladder with 1 to 2 pints more of boric-acid solution. These precautions may seem troublesome, but laboratory experiments and clinical experiences thus far show that herein lies the only reliable prophylaxis against the production of a catheter cystitis.

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THE EVOLUTION OF MODERN CYSTOSCOPIC INSTRUMENTS AND METHODS.

BY

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(With eight illustrations.)

NOTWITHSTANDING the remarkable advances which have been made in all departments of the medical sciences during the past half-century, few are more striking than these pertaining to the urinary organs; and when we realize that this great progress in the knowledge of the affections of these organs was mainly dependent upon the development and perfection of cystoscopy, we cannot fail to be impressed with the importance of this procedure. Less than thirty years ago little was known, except in a very vague and elementary way, of the diseases of the

urinary apparatus, and the treatment of these affections constituted a veritable *bête noir* for the practitioner. To-day, on the other hand, these diseases have become thoroughly understood and classified, and many of them which were formerly regarded as practically incurable are readily amenable to treatment.

The vesical speculum or cystoscope furnishes a means of accurate diagnosis and differentiation in renal and vesical conditions which would inevitably be confused with one another and with diseases of other viscera were we compelled to rely solely upon the symptoms and urinary examination in each case without the possibility of directly inspecting the interior of the bladder or of catheterizing the ureters to ascertain the presence or absence of stricture, stone, hydro- or pyoureter, etc. Also in the treatment of many of these disorders the cystoscope is indispensable and its range of usefulness is further extended to the field of gynecological surgery, where catheterization of the ureters is often an important preliminary step in operations involving great danger of injury to those ducts—for example, in hysterectomy for uterine carcinoma, where extensive removal of the parametric tissues is imperative.

I trust that a brief review of the steps in the evolution of the perfected instruments and methods employed to-day in this most useful field of work will not be devoid of interest, embracing, as it does, the history of certain important principles of cystoscopy, which I shall endeavor to emphasize.

The pioneer work in devising a means of examining by sight the cavities of the body was done by a German physician, Dr. Bozzini, of Frankfort. The instrument which he designed for this purpose was called a "Lichtleiter" (light conductor). In the article in the *Journal der praktischen Heilkunde*, 1806, Bd. XXIV, in which the instrument is described, Bozzini emphasized the importance of inspection as an aid in diagnosis which had hitherto been neglected in the investigation of the closed body-cavities and predicted a vast gain in knowledge of the functions as well as the diseases of the hollow organs whose cavities could be rendered accessible to view by means of suitably designed instruments.

The "Lichtleiter" consisted of two principal parts: (1) an upright stand having somewhat the appearance of a vase, about $12\frac{1}{2}$ inches high, slightly over 3 inches broad and $1\frac{2}{3}$ inches

thick, containing in its lower half a candle for illumination, which projected slightly into an anteroposterior circular opening just above the middle of the stand; (2) specula of various designs, differing according to the organs for which they were intended to be employed, which were fitted into the circular opening in the stand when used. The cavities which Bozzini proposed to explore with his instruments were those of the larynx, the nose, the ears, the vagina, the uterus, the female and the male urethra, the female bladder and the rectum. The speculum intended for the female bladder (Fig. I), the one of greatest interest in connection with our subject, was a tiny silver tube about two lines (1-6 inch) in diameter and $1\frac{1}{2}$ inches long, having at its ocular end a funnel-like expansion (a) and near its distal end an elastic, metallic spiral (b) which allowed the tip of the tube to move in various directions.

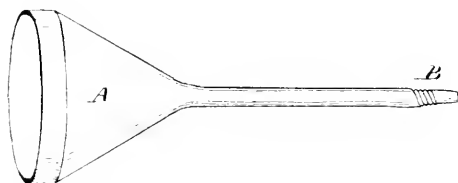


Fig. I.—Female Vesical Speculum for Bozzini's "Lichtleiter."

The Medical Faculty of Vienna and the Josephine Academy were appointed by the Austrian government conjointly to examine this instrument, and the report of these learned bodies, here given, was unfavorable to the invention: "The introduction into the external opening of the tube which transmitted the light was found not to be exempt from pain, especially when the part was diseased; the illuminated surface was too circumscribed, not being at most more than one inch in diameter; again it did not exhibit the parts sufficiently distinctly. Finally, although the instrument was judged susceptible of improvement, the reporters believed that *it could not be considered in any other light than a toy.*"*

* *Phil. Jour. Med. and Phys. Sci.*, 1827, XIV, p. 409.

While this report sets forth the rude instrument's many imperfections, it at the same time shows a lack of even so much as a suspicion, on the part of these learned judges, of the important results, which, with perfected methods, were to be achieved by the application of the principles embodied in the construction of the instrument which they had ridiculed.

In spite of the unfavorable attitude of the medical profession towards Bozzini's work, his invention was soon followed by the extensive employment of cylindrical vaginal specula in the investigation and treatment of vaginal and uterine diseases, and the knowledge of these affections thus obtained awakened a desire to perfect a means of rendering the interior of the bladder accessible to exploration in a similar manner. A speculum for accomplishing this purpose was devised by S. Ségalas, of Paris, and exhibited before the Royal Academy of Sciences of France in December, 1826.

The instrument was intended for inspection of both urethra and bladder, and because of its twofold use, was called a urethro-cystic speculum. It is described in Ségalas' "Traité des

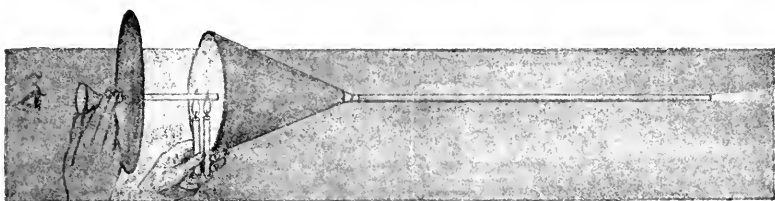


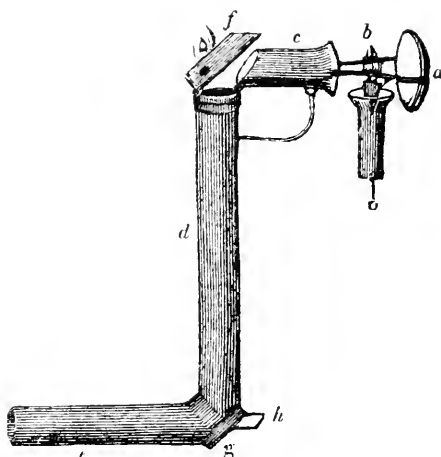
Fig. II.—Ségalas' "Urethro-cystic Speculum." From an engraving in the atlas accompanying his treatise, entitled, "Traité des Retentions d'Urine," Paris, 1828.

Retentions d'Urine et des Maladies qu'elles produisent." An atlas accompanying that work contains engravings showing the speculum and other urethral and vesical instruments.

Ségalas' apparatus (Fig. II) consisted of (1) a straight silver tube for introduction into the urethra; (2) a hollow, conical mirror with an opening at its apex, into which the proximal end of the urethral tube fitted; (3) a solid rubber bougie, which fitted into the urethral tube to act as an obturator during its introduction; (4) a circular, concave mirror, four inches in diameter, through the center of which a second silver tube was thrust so that it projected about two and a half inches beyond the surface of the mirror; and (5) two candles to furnish the illumination. The urethral tube was highly polished on its interior and varied in length and diameter according to the size of the urethra of the patient. For the female a much shorter tube than that represented in the figure was used. The tube which projected through the center of the concave, circular mirror was blackened on its interior surface and was intended to shut off from the eye of the examiner all light except that

coming from the illuminated areas in the urethra or bladder; it was four or five inches long and had a diameter approximately the same as that of the urethral tube. The two candles furnished the light, which was reflected from the concave mirror through the urethral tube into the cavity of the bladder.

The instrument was used mainly for examination and treatment of diseased conditions of the urethra, especially gonorrheal inflammations and strictures, but not affording a satisfactory view of the bladder, it was of very little value as a cystoscopic instrument.



The fact is of interest that one of the earliest attempts to construct "an instrument for illuminating dark cavities" of the body was that of an American physician, Dr. John D. Fisher, of Boston. The device which he proposed was described at length in the *Philadelphia Journal of the Medical and Physical Sciences*, 1827, Vol. XIV, 409, with an accompanying diagram, of which Fig. III is a reproduction. "The instrument consists of a concave mirror, a; a light, b; three tubes, c, d, e; and two looking-glasses, f and g. The concave looking-glass, a, is connected with the tube, c, by two supports, as represented in the figure, from which is suspended a candlestick, with a hole in the bottom, through which a wire is introduced for the purpose of elevating or lowering the candle so that the flame may be opposite the center of the lens. The tube c, is somewhat en-

larged at its extremity towards the light; it is united to the tube, d, by a hinge, and is kept in its proper position by a bent wire which is attached to it, and fits into a sort of rack on the tube, d; d and e are cylindrical tubes united together at right angles, forming an elbow-joint, the external angle of which is cut off, and the aperture closed by a looking-glass, g; f is a looking-glass united to the tube, d, by a hinge; the amalgam is scraped off a portion of this glass or a hole made in it, as represented in the figure. In the tube, c, a double convex lens is placed to concentrate the light on the looking-glass, f, and a similar lens is contained in the tube, c, to magnify the object to be viewed. This latter lens is fixed in a ring, to the sides of which is attached the wire, h, and by means of which it may be moved so that the object may be in its focus.

"It is scarcely necessary to add that the tube, c, is to be introduced into the dark cavity, and that the light is reflected by the mirror, a, through the tube, c, to the looking-glass, f, by this it is thrown through the tube, d, on the looking-glass, g, and by it reflected into the dark cavity. The illuminated spot reflects the light back again to the mirror, g, and by that it is conveyed to the eye of the spectator; of course the image of the illuminated spot is seen in the mirror, g."

There is no evidence that this instrument was ever tested practically and it is impossible that any satisfactory results could have been secured with so crude and complicated an apparatus.

Dr. August Haken, of Riga, published in the *Wiener medizinische Wochenschrift* (March 22, 1862) the description of a new urethral dilator for urethroscopy, and in this article he recommended for exploring the female bladder and urethra the use of metallic tubes, blackened inside, 5.5 cm. long, ranging in caliber from No. 12 to No. 17 of the English scale, having a funnel-shaped attachment 2 cm. long, firmly fixed on the outer end. In order that they might be introduced into the urethra with ease, each tube was provided with a blunt-pointed obturator which completely filled the lumen. They were to be used in the following manner: After emptying the bladder with a catheter, the patient being in a recumbent or sitting posture, the urethral tube, provided with an obturator, was introduced, and the obturator being then removed, light was reflected into the tube by means of a concave head-mirror. These tubes were never employed to any advantage in examining the bladder.

The next vesical speculum invented—the “endoscope” of A. J. Desormeaux, of Paris, which was exhibited to the Imperial Academy of Medicine, in 1855*—possessed great advantages over its predecessors, being, in fact, the first instrument with which any important results in examining and treating diseased conditions of the vesical mucosa were accomplished. On account of thus having been the first to establish the practi-

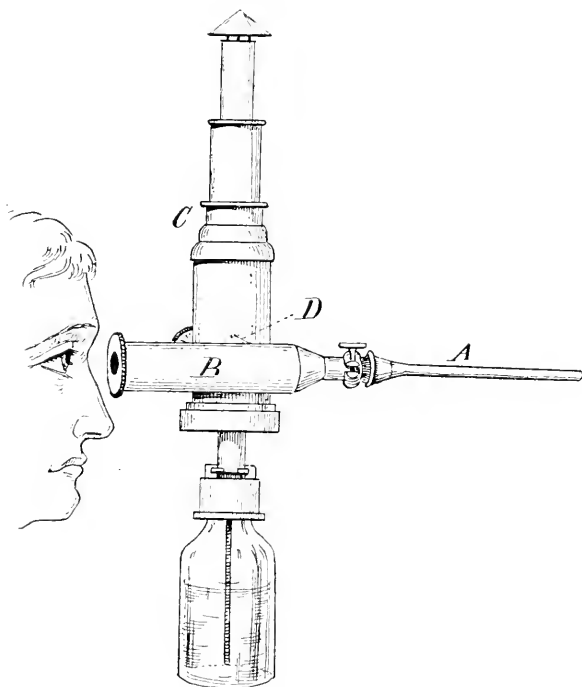


Fig. IV.—Desormeaux's Endoscope, devised 1853. (From cut in Desormeaux's treatise, “De l'Endoscope et de ses Applications au Diagnostic et au Traitement des Affections de l'Urèthre et de la Vessie.” Paris, 1865.)

cability and importance of the procedure of examining the interior of the bladder by means of a suitable speculum, Desormeaux has been called, not without justification, “the father of cystoscopy.” His instrument is described in a work which he published in 1865, “De l'Endoscope et de ses Applications au Diagnostic et au Traitement des Affections de l'Urèthre et de la Vessie.”

**Bull. de l'Acad. de Med.*

In Fig. IV the apparatus is shown. It comprises three fundamental parts: a urethral tube or speculum, A and A¹, an ocular tube, B and a lamp, C. There were two designs of the urethral tubes or specula: One for the female, A, was a simple straight tube, conically expanded at its outer extremity, where it contained a long aperture in its side to allow the introduction of slender instruments for the purpose of making medicinal applications to the exposed mucosa. It was provided with an obturator, which was withdrawn after introduction of the speculum. The other specula, those designed for use in the male bladder, were similar in appearance to those just described, except that they lacked the aperture in their side, and near their inner end were bent to form an obtuse angle or elbow at which was an opening, in the axis of the longer portion of the tube, closed and rendered water-tight by a small glass disk. These instruments were introduced in the same manner as an ordinary metallic male urethral sound. There were various sizes of both varieties of these specula, ranging in diameter from 3 to 8 mm. The ocular tube, B, contained a silver mirror set at an angle of 45° across the lumen for reflection of light from the lamp through the speculum. This was pierced at its center by a circular opening for the examiner to look through. In the lamp, C, was another silver mirror which reflected the light from the flame, upon the mirror in the ocular tube. The lamp was joined to the ocular tube by means of a cylinder, D, into which a cylindrical projection from the side of the tube fitted. These cylinders contained a lens which concentrated upon the mirror in the ocular tube the light reflected from the mirror behind the flame. In using the apparatus, after inserting the speculum the ocular tube was attached to its outer end and the lamp then connected with the ocular tube in the manner described above.

The details of the instrument were quite elaborate: The lamp was designed to give as intense and steady a light as possible, to avoid becoming excessively hot, and to discharge the products of combustion where they would be the least troublesome to the examiner; the mirrors were made of silver instead of glass and mercury owing to the inability of the latter to stand the heat to which the reflector was subjected or to be made thin enough for the pierced mirror; the ocular tube was provided with eye-pieces suitable for myopic or hyperopic

eyes; the junction of the speculum with the ocular tube was rendered immovable by means of a screw.

This apparatus is remarkable for the great number of its important original features which were subsequently utilized in the construction of our improved instruments. The difficult problem of inspecting the interior of the male bladder was first solved by Desormeaux and the method and instrument designed by him for that purpose embody most of the fundamental features of the instruments and methods now used, such, for example, as distention of the bladder with water and the employment of a speculum fashioned after an ordinary metallic urethral catheter for easy introduction, having at its distal end a tiny glass window which permitted the illumination of the bladder cavity without allowing the escape of the water with which the organ was distended.

Notwithstanding the expensiveness of Desormeaux's elaborate and delicate apparatus, it was quite extensively employed in England, Germany and America. Dr. Robert Newman, of New York, presented before the N. Y. State Medical Society, in 1872, a paper on the use of the "endoscope," together with a number of cases in which he had used the instrument in the treatment of vesical and urethral diseases in women with good results.

The original endoscope underwent many, though unimportant, modifications in the hands of the various specialists who employed it in their work. Although this instrument marks a great advance in the development of cystoscopy, it was, nevertheless, full of imperfections and the results obtained with it were correspondingly imperfect, as evidenced by the statement of Desormeaux himself concerning the ureteral orifices: "I need not tell you that they cannot be seen."

A new vesical speculum for the female, which was used with the bladder distended with air, was described by Rutenbergl, of Vienna, in 1876.* The diameter of the portion of the instrument which entered the urethra was about 2 cm., requiring a dilation of the urethral canal to its extreme safe limit, and hence could not be used except when the patient was profoundly anesthetized. The instrument was commended by Prof. F. Winkel, who used it in a large number of cases. He, however, was never able to see the ureteral orifices. The construc-

**Deutsche Zeitsch. f. prakt. Medizin.*, Feb. 12, 1876, S. 73.

tion of the instrument was such that it did not permit the use of instruments in the bladder, as for the removal of vesical calculi or making topical applications in cystitis.

A diagram of the instrument is shown in Fig. V. The cylindrical urethral portion (a) was 7 cm. long and 2 cm. in diameter; the ocular portion (b) was screwed on the outer end of the urethral portion after the introduction of the latter into the urethra; air was then forced, by means of a rubber bulb, through the tube (c) into the bladder. The glass window (d) prevented the escape of the air and allowed the reflection of light from a gas or oil lamp, by means of a head-mirror, into the mirror (e), thence onto the bladder walls. The mirror (e) could be moved, by means of the rod (f), backward or forward or rotated from side to side in order to expose various parts of the interior of the bladder.

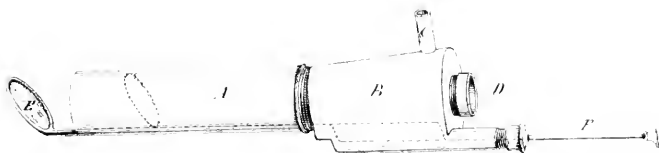


Fig. V.—Female Vesical Speculum. Dr. Rutenberg, Vienna. (*Deutsche Zeitschr. f. prakt. Med.*, No. 7, 1876).

The work of G. Simon, of Rostock, while contributing nothing directly to the development of ideal cystoscopic instruments and methods, did much to stimulate the interest in diseases of the urinary organs. In 1875 he demonstrated a method of exploring the bladder by palpation with the finger introduced through the dilated urethra. By this method, under the guidance of touch alone, he repeatedly passed slender bougies into the ureters—a feat which, although never applied by its originator to any practical purpose, has become of inestimable value as it is now employed; *i. e.* by using cystoscopic methods instead of palpation.

The first method of examining the bladder which reached such a degree of perfection as to enable the examiner to see the ureteral orifices was that of Joseph Grünfeld, of Vienna, which was described in 1877. The specula used by Grünfeld for the female bladder were simple straight tubes, with a funnel-shaped outer end and an obliquely-cut inner end closed by a tiny, thin,

glass window as shown in figure VI, B. For the male the speculum was modified by being made longer, curved near the inner end so as to have the shape of a Charrière sound and having at the greatest convexity of the curve, in the long axis of the canal of the speculum, a thin, glass window like that in the end of the female speculum (Fig. VI, A). He also used specula of somewhat different design for examining the urethra. In examining the bladder the organ was filled with water. Escape of the water through the speculum was prevented by the little water-tight glass windows described above, which closed the lumen of the tube. The illumination was the same as that used in Rutenberg's method. By means of his instruments Grünfeld was able to see the ureteral orifices in the female, and he even passed a small bougie into the ureter, although he never turned this to any good account.

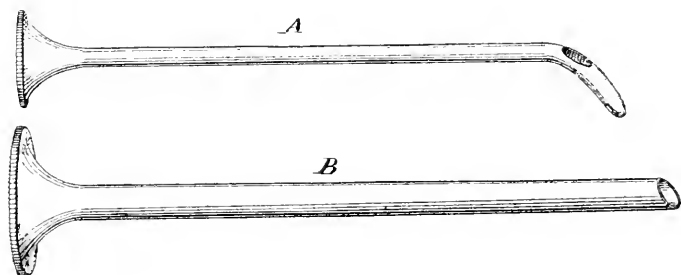


Fig. VI.—Grünfeld's Vesical Specula. A, male; B, female.

Not until the invention of the admirable cystoscope of Nitze was an instrument produced which fulfilled all the requirements of modern cystoscopy, affording a clear view of the vesical mucosa and rendering catheterization of the ureters comparatively easy after some practice.

Nitze's first instrument was invented in 1879.* It has since been modified in some of its details, most valuable suggestions as to its construction having been made by Leiter, the manufacturer of the instrument. In its present perfected form it is used by genitourinary specialists in nearly all the large cities of Europe and America. It consists of a long, tubular catheter with a short bent portion at the inner end; this bent portion carries a tiny electric incandescent lamp at its tip which is de-

**Wien med. Woch.*, Nos. 24, 26, 29 and 30.

tachable by means of a screw-joint. Just in front of the bend in the tube there is a small fenestrum in the tube-wall into which a prism is set for the purpose of directing the light reflected from the wall of the bladder into the tube; the tube further contains a series of lenses with a telescopic arrangement, designed to give a wide field of vision and to magnify the image of the bladder wall. (See Fig. VII.) This instrument, like Grünfeld's, is used with the bladder distended with water. For use in the female the tubular portion is made shorter, larger in caliber, and straight. With this apparatus it is possible to get

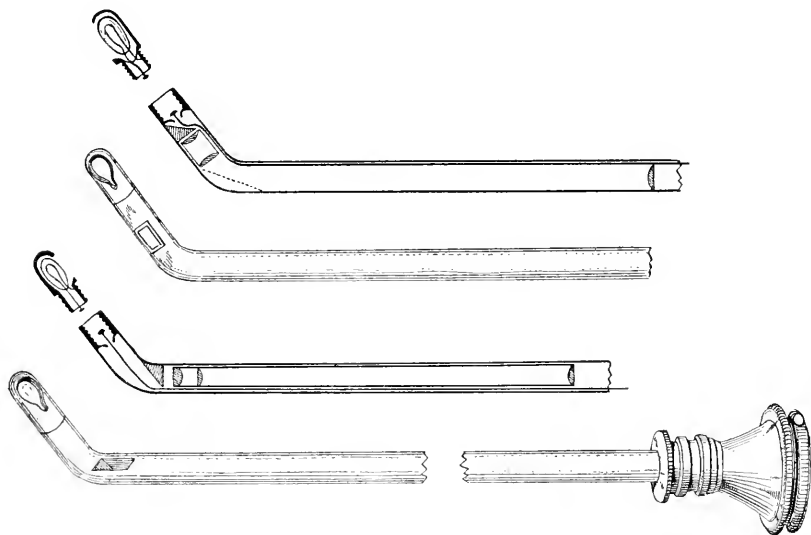


Fig. VII.—Lebrbuch der Cystoskopie, Max Nitze, 1889.

a good view of all parts of the interior of the bladder and by means of a small tubular attachment to the side of the cystoscope, to pass catheters into the ureters. Nitze himself has even removed successfully small tumors from the inner wall of the bladder by using wire snares passed in, like the catheters, through a small tube alongside of the cystoscope. Various slight modifications of Nitze's cystoscope have been made to suit the fancy of individual operators and bear the names of Casper, Albarran, Brenner, Fenwick, and others.

The cystoscope of the Nitze type is the best instrument for cystoscopy in the male, but is unnecessarily elaborate, delicate

and expensive for examining the female bladder where the conditions are so much simpler than in the male.

The ideal for the female bladder was attained when, in 1893, Dr. Howard A. Kelly, of Baltimore, described his vesical speculum or cystoscope for the air-distended bladder.*

In general design Kelly's vesical speculum is somewhat similar to that of Grünfeld shown in Fig. VI, differing only in the lack of the obliquely-cut, fenestrated inner end and in the addition of a handle to the funnel-shaped outer end. (See Fig. VIII.) The instrument is made entirely of nickel-plated metal—preferably German silver.

Its urethral portion is a simple, straight, open tube 5 to 8 cm. long and made in a series of sizes ranging from 5 to 20, the size number indicating in millimeters the diameter of the tube measured from the outside. The vulvar portion of the speculum is expanded, funnel-like and has a handle attached to it at an angle of about 120° to the urethral tube.

In an article in the *AMERICAN JOURNAL OF OBSTETRICS*, Vol. XLI, No. 6, Kelly suggests slight changes in the construction of his speculum, shortening the urethral portion, enlarging the vulvar portion, and making the handles detachable for convenience in packing the instrument.

In the hands of several specialists Kelly's speculum has undergone slight modifications, the most noteworthy of which is that of Dr. Garceau, of Boston, who has devised an attachment for the cystoscope to act as an evacuator by sucking up urine which may accumulate in the bladder during examination.†

The technique employed in making a cystoscopic examination according to Kelley's method is briefly as follows:

The patient, after completely emptying her bladder and having the vulva thoroughly cleansed, assumes the dorsal posture on the examining table. No general anesthetic is required except in rare cases of extremely nervous and unmanageable women, or when there is much hypersensitiveness of the bladder due to disease, local anesthesia in the great majority of cases rendering the examination free from severe pain. To effect this a small piece of sterile absorbent cotton saturated with a 10 per cent. solution of cocaine hydrochlorate is placed in the urethra and allowed to remain 3 to 5 minutes. The urethra is

**Johns Hopk. Hosp. Bull.*, Nov., 1893; *AMER. JOUR. OBST.*, Jan., 1894.

†*Boston Med. and Surg. Jour.*, 1895, cxxxiii, 444.

then dilated to the required diameter by using a small conical dilator especially designed for that purpose. The patient is then placed in the knee-chest posture, causing the intestines to gravitate toward the diaphragm, thus producing a negative pressure in the hollow viscera of the pelvis. Now a speculum is placed in the vagina, and air at once rushes in and distends the organ. (This is done in order to force the base of the bladder downward where it is readily accessible to view; otherwise the trigonum would be drawn up behind the symphysis out of reach during the examination.) A similar atmospheric distention of the bladder is next secured by introducing the speculum through

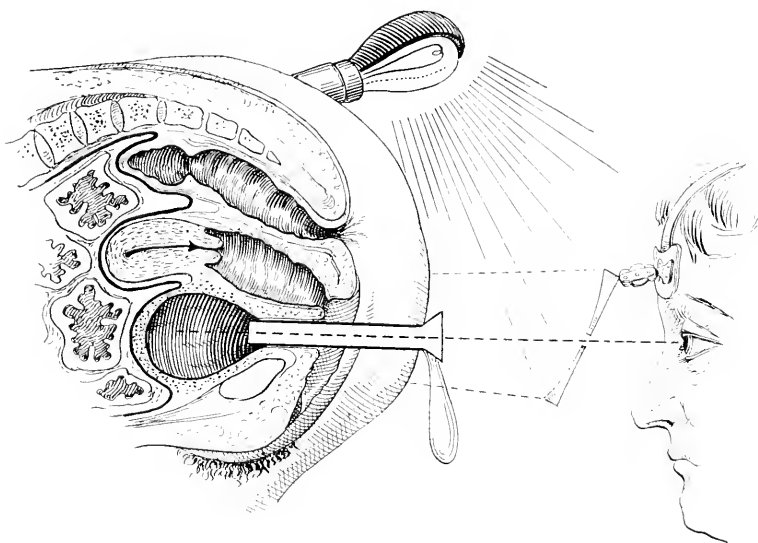


Fig. VIII.—Kelly's Method of Examination of the Bladder in the Knee-Chest Posture. (From *Operative Gynecology*, Kelly, Vol. I., p. 283.)

the urethra and withdrawing the obturator, allowing an influx of air. Lastly the inner walls of the bladder exposed in this way are illuminated by light thrown through the lumen of the speculum by an electric head lamp or reflected by a head-mirror. (See Fig. VIII.)

The method of "endoscopy" as practised by Pawlik, of Prag, which was first published in the *Centralblatt für Gynäkologie*, May 5, 1894, 5 months after the publication of Kelly's method of cystoscopy, is identical in all essential respects with Kelly's method,

except (1) that the bladder cavity is illuminated by means of an electric lamp introduced on a long, slender handle through the speculum, instead of by light reflected by a head mirror; (2) that the specula or endoscopes described by Pawlik in the article just cited are, presumably, of much larger size than those ordinarily used by Kelly, for in order to dilate the urethra sufficiently for the introduction of Pawlik's specula the patient must always be anesthetized.

Having thus reviewed the work of developing efficient methods of inspecting the interior of the bladder, we have seen that the condition wherein the earliest attempts were lacking or faulty were, mainly: (1) in distention of the bladder in order to render large areas of the vesical wall accessible to view, instead of only small areas limited to the size of the lumen of the speculum; (2) in illumination; and every advance which was subsequently made was only a nearer approach to perfection in those conditions.

We have seen that the first important contribution towards the attainment of an effective method of cystoscopy was made by Desormeaux, who, recognizing the impossibility of making a satisfactory inspection of the bladder while the organ was collapsed, distended it with water before introducing his speculum. Distention by this means was subsequently used by Grünfeld and Nitze. Rutenberg was the first to use air for the distention, but in his hands this method had little or no superiority over the water distention and it remained for Kelly to demonstrate the advantages of the method of atmospheric distention by employing postures for the patient which would cause the bladder to dilate like the vagina in Sims' posture.

In any method of cystoscopy distention of the bladder and illumination are of fundamental importance and therefore a brief enumeration of the various ways in which these ends are accomplished and the advantages and disadvantages of each will be of interest in concluding our paper.

For distention, as we have seen, either air or water may be used. Atmospheric distention can be accomplished by pumping air into the bladder or by creating a negative pressure in the bladder by posture. When the former means is employed it is necessary to use a speculum whose lumen is occluded by a transparent glass disk to prevent the escape of the air from the bladder (Rutenberg). The postural method has

the advantage that it permits the use of a speculum with a free, open lumen through which one looks directly upon the vesical walls and may introduce various kinds of instruments under direct vision (Kelly, Pawlik). The use of water for distention (Desormeaux, Grünfeld, Nitze) not only requires that the lumen of the speculum be tightly closed to prevent the bladder from emptying itself, but also has the disadvantage of being liable to clouding by blood or pus, and should therefore not be used in preference to air, except in the male bladder, where the conditions necessitate the use of a complicated instrument with a lamp, which requires a cool liquid medium to prevent burning of the tissues (Nitze).

For illumination, a lamp may be introduced into the bladder (Nitze, Pawlik) or light may be thrown into the bladder from without: (1) directly from a lamp, such as the electric head-light, or (2) reflected from a head-mirror, as shown in Fig. VIII. (Haken, Rutenberg, Grünfeld, Kelly).

Although illumination by reflection from the head-mirror requires a strong, concentrated light and considerable practice in directing the light through the lumen, it is the method most frequently used because the ordinary 16-candle-power electric drop light is such a convenient and satisfactory source of light. The electric head-lamp also gives a very satisfactory illumination. The tiny electric lamps introduced into the bladder for illumination are so extremely delicate that they are liable to frequent breakage or to destruction by too strong a current, and they, moreover, require a complicated cooling apparatus to prevent burning of the tissues.

The objections to the cumbersome illuminating apparatus of Ségalas' and Desormeaux's instruments are obvious.

CYSTOCELE.*

BY

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IN order to discuss this subject in a broad and comprehensive way, it is important that the anatomy of the female bladder, its position in the pelvis, its relation to adjacent organs and structures, and especially its supports, be briefly reviewed.

The bladder is a thin-walled musculomembranous sac imbedded in connective tissue, covered on its superior aspect by peritoneum, and lined with mucous membrane. The function of the bladder is to receive the urine as rapidly as it is excreted by the kidneys, to act as a reservoir in retaining it for varying lengths of time, and finally expelling it at more or less regular and convenient seasons. Its capacity varies from zero, when it is in a state of detrusory contraction, to one or two pints. Its walls are very elastic, however, and have been known to expand without rupture to an extreme capacity of three quarts, and even more. This property of expansion is confined almost exclusively to its upper hemisphere or that part which is covered by peritoneum.

The process of expansion and contraction as observed in the interior of the bladder and graphically described by Howard Kelly is as follows: As the bladder empties, the upper, more movable portion, covered with peritoneum, settles down into the lower and relatively more fixed portion, which lies in close relation to the vagina, until it comes to lie within it as one saucer rests in another. During respiration the free upper half may be seen (through the cystoscope) moving on the lower half, as if hinged, and the line of demarkation between them may be distinctly made out. At the edges where the two saucers meet, three folds are formed: the right, left, and posterior. The posterior fold stretches from side to side in front of the uterus; it is gently convex forward, following the contour of the uterus and ends in front of each broad ligament, where each lateral fold begins and extends horizontally around to-

* Read before the New York Obstetrical Society, May 8, 1906.

ward the urethra. These folds represent the physiological hinges on which the bladder moves in expanding and collapsing. The apices, where the posterior fold joins the lateral folds in front of the broad ligaments, are called the right and left vesical cornua.

Position and Relations of the Bladder.—(For the purpose of this description I shall consider the patient as upon her feet, standing in an upright posture. In this position the symphysis pubis is under the body on a line with its center of gravity, and on a lower level than the tip of the coccyx.) The bladder is located in the anterior lower quadrant of the pelvis, extending obliquely backward and upward from the symphysis below, to the uterus above. Between these two landmarks the bladder wall is in intimate contact with the anterior vaginal wall which stretches in an almost direct line from the symphysis pubis to the uterus. The vaginal wall has for its main support a fascia, the vaginal sheath, composed of strong connective tissue fortified by the uterovesical ligaments reaching from the uterus to the rami of the pubis at the symphysis. From the line of insertion of the vagina into the uterus the bladder is spread over the anterior face of the uterus as high as the posterior fold (previously described) and laterally on the face of the broad ligaments adherent to their connective tissue as far as the "cornua of the bladder" and bounded by the lateral folds in an elliptical line back to the symphysis. The space of Retzius, filled with cellular tissue, lies at either side of the bladder, and the prevesical space of Retzius fills in the triangular space where the peritoneum is reflected from the bladder on to the abdominal wall above the symphysis pubis. All the adherent part of the bladder composing the lower hemisphere is comparatively inelastic and does not participate in its expansion. It is here that we must look for the bladder supports.

Supports of the Bladder.—In the understanding of all anatomical arrangements or physiological functions it is of the greatest assistance to discover Nature's plan. That is the key to the situation. Now, in the plan of retaining organs of the human body in place, Nature's scheme is that of suspension from the bony frame work by ligaments or tissues that serve the purpose of ligaments. The heart, the lungs, the liver, the stomach, the intestines, the colon, the spleen, the kidneys, the uterus are all suspended by ligaments. This condition is so

universal that I think we may accept it as Nature's plan. Now the question is how completely is this applied in sustaining the bladder?

There are three methods of considering this question:

First, by an investigation of the anatomical attachments of the bladder under normal conditions.

Second, by considering how these supports are affected in unusual conditions, such as pregnancy and fibroid tumors.

Third, by reviewing these points in cases of extreme pathological conditions.

Gray says the bladder is retained in its place by ligaments. Of these there are five: two uterovesical ligaments, reaching from the posterior face of the os pubis to the uterus, composed of connective tissue and containing muscular fibers. [I think it would be clearer to describe these ligaments as the anterior or vesicopubic, and the posterior or vesicouterine ligaments, the anterior arising from the os pubis and inserted into the fascia at the base of the bladder, and the posterior arising from the cervix uteri, passing forward and inserted into the same fascia at the base of the bladder, the inserting fibers of the two ligaments being more or less continuous.] The third and fourth are the lateral ligaments, one on either side, known as the rectovesical fascia, arising from the pelvic wall and laterally inserted into the fascia at the base of the bladder, and the fifth is the urachus, a fibromuscular cord extending from the anterior superior face of the bladder to the umbilicus.

In addition to these supports we have the peritoneal attachments, between the uterus and the bladder, the lateral reflections, at the physiological hinges along the side, and the fold of peritoneum as it follows the urachus at its origin from the bladder up onto the abdominal wall. All these supporting tissues or ligaments, with the exception of the urachus, have the peculiarity of being inserted into the under surface of the organ to be supported, and here we have the base of the bladder, a fixed, inelastic comparatively immobile structure, so that the bladder is suspended as in a sling.

The base of the bladder is intimately associated with the sheath of the vagina—a strong fibrous structure—being firmly attached at its upper end to the uterus, and at its lower end to the os and symphysis pubis. It thus appears that the uterus as a point of origin of the supporting ligaments and fascia be-

comes an important factor in bearing the weight of the bladder, the uterus in turn being supported by its ligaments. As a woman stands in the upright posture a portion of the bladder rests also on the obliquely sloping posterior face of the os and symphysis pubis.

Secondly; in pregnancy, unless a cystocele be present, the bladder is carried up by the rising uterus showing that it gets its support from that organ. Likewise, in fibroid tumors originating in the lower anterior segment of the uterus, the anterior vaginal wall instead of sagging, is carried up by the rising tumor and uterus. In overdistention of the bladder, due to retention, there is rarely any bulging down of the base of the bladder to seek support from the floor of the pelvis. The ligaments are all-sufficient to meet the strain, and the hydraulic pressure carries the dome of the bladder high in the abdomen. This was markedly demonstrated in a case of retention with overflow, which I saw in consultation about one year ago. The patient had been subjected to laparotomy for removal of pyosalpinx; about ten days later, when convalescence seemed well established and the use of the catheter discontinued, she began to complain of abdominal pain with daily increasing intensity. There was abdominal enlargement, nontympanitic in character, failing appetite, and general demoralization. Still she was passing the normal daily amount of urine. From that patient I drew per catheter, by careful measurement, 95 ounces of urine, and still did not exhaust the supply. In this case—a point which greatly impressed me at the time, although the base of the bladder was very tense, there was but slight bulging of the anterior vaginal wall—the normal supports of the bladder being sufficient to keep it off the floor of the pelvis.

Thirdly; in cases of uterine descensus and procidentia, with or without laceration of the pelvic floor, the uterine support of the bladder having been removed, the latter invariably comes down. In making this assertion I am not unmindful of the fact that Kelly (Johns Hopkins Hospital Rep. on Gynecol., Vol. II, 1892, p. 311) reports a case of uterine procidentia, in which the bladder having become completely detached from the uterus and vaginal wall, remained entirely inside the pelvis. This extraordinary exception, corroborated by similar cases narrated by a number of other reporters, viz.: Kalténbach, Hueffell, only suffices to prove the rule and point out most clearly my

contention that the ligaments of the bladder are all-sufficient for maintaining it in place under most extraordinary circumstances, and that building up the perineum for the purpose of supporting the bladder as formerly taught is a false and delusory proposition. A circumstance contributory to this conclusion is the fact that, as a rule, in complete laceration of the perineum, whereby all support of the pelvic floor is entirely abolished, the bladder, and likewise the uterus, remain in their normal position.

To my mind, these facts and considerations justify the conclusion that the bladder, like all the other organs of the body, conforms to Nature's plan of suspension by ligaments.

Etiology.—For the efficient working of this scheme of support from above, two conditions are essential: the ligaments themselves must have sufficient strength for the strain placed upon them, and the points of insertion must be equally stable and resistant. It is of little avail that the blocks of a hoisting machine are strong, if the rope rove through them is inadequate to its burden; and *vice versa*, it accomplishes naught to have a strong rope if the support or the pulley-block fails. In cystocele the ligaments, as a rule, are not found wanting; the fault lies either in the giving way—the descensus—of the chief point of support above, viz., the uterus; or the rupture of the pulley-block, viz., the point of insertion of the ligaments, which is the fascia at the base of the bladder. In many instances the cystocele is the result of both these accidents.

An explanation of the first-mentioned cause of cystocele involves, therefore, the etiology of descensus and prolapsus of the uterus. Speaking briefly, the cause of prolapsus uteri may be found in an elongation and weakening of the ligaments above, which normally support the uterus. This weakening and elongation may be due to a pulling force below, which does not exist normally, but has been introduced by the dragging action of a rectocele, the result of a weakened or lacerated floor of the pelvis. Subinvolution of the uterus and its ligaments after parturition (I lay especial stress upon the involution of the ligaments because that is rarely mentioned, for we are apt to forget that the uterine ligaments are muscular in structure and hypertrophy, and involute as does the uterus) is the most common cause of the weakening of the supports above. This permits the cervix to slip down into the axis of the vagina,

the fundus to retrovert and follow after, dragging the anterior vaginal wall and the base of the bladder with it. If, in addition to subinvolution, there has been a laceration of the perineum, or floor of the pelvis, the bulging rectocele drags strongly on the uterus and hastens the result. Indeed the latter force may be sufficient even in the presence of normally-resisting ligaments to overcome their sustaining power, drag the uterus down, and produce a cystocele. This process is usually slow and the appearance of the protruding anterior vaginal wall and bladder gradual and progressive.

Exceptional cases must be mentioned in which the uterine body remains in normal position, but there is a descent of the upper support of the bladder in nulliparous and even unmarried women—virgins. The etiology here consists of an elongation of the supravaginal portion of the cervix, due to hypertrophy of the uterine tissue. This permits, indeed occasions, the descent of the upper end of the vagina producing a sagging of the vaginal wall and consequently the base of the bladder. This initial elongation pushes down the vaginal supports, but later the rôles are reversed and the vaginal prolapse drags on and increases the elongation of the cervix. In some of these cases the primary hypertrophy of the supravaginal cervix is confined to the anterior lip. In these instances there exists a protrusion of the anterior vaginal wall with the bladder behind it, but unaccompanied by a rectocele.

We come now to the cases in which the pulley-block—the fascia at the base of the bladder—has given way. This accident partakes in all its details of the character of a hernia—indeed it results in a hernia of the base of the bladder through the supporting fascia, carrying the vaginal wall and the ruptured stretched and weakened fascia before it. Now how does this happen? It is plainly an accident of parturition; but an avoidable accident, as I hope to show.

By a line drawn through the axis of the vagina and extending up into the axis of the uterus, the pelvic floor is divided into two segments; the posterior or sacral segment and the anterior or pubic segment. These two segments overlap each other at their free borders like two folding doors, one opening in one direction and the other in the opposite direction—the anterior or pubic section opening upward and the sacral segment opening downward. This is what occurs in a normal pregnancy in

which the parts functionate properly in all details; *i.e.*, the anterior segment, the front door, opens inward and upward before the advancing head, the anterior lip of the uterus, the bladder, and the vaginal wall being carried above the symphysis, leaving its posterior face and inferior border—the arch—comparatively free from superimposed tissue, thus affording the greatest possible diameter to the canal. This lifting process is undoubtedly due to the uterine contractions in its efforts to empty itself—the long powerful detrusor muscle of the uterus reaching from the anterior lip up over the fundus and down to the posterior lip as it contracts tends like every other muscle to draw together its two extremities and in doing so lifts the cervix and its dependent tissues, the bladder and vagina. If, however, the voluntary intraabdominal pressure has been brought into requisition too early and forced the entire uterus and its contents down before the cervix has dilated sufficiently to permit the uterine contractions to properly open the door, then the anterior lip of the cervix, with the vaginal wall and bladder may present at the vulva under the symphysis, be caught there, and the entire door, the pubic segment, be forcibly pushed open in the wrong direction. In this position the base of the bladder, being constantly distended by the urine steadily trickling into it, becomes stretched to the bursting point; the fibers of the fascia give way at various points, its supporting power is lost, and the bladder protrudes through it in the guise of a hernia. When this accident has occurred the cystocele declares itself more or less promptly after parturition. If subinvolution follows the delivery, both causes of cystocele are present and the condition becomes still more aggravated.

If my explanation of this form of cystocele, the hernia, is correct, the prophylaxis is plain and the responsibility rests with the accoucheur. His maxim should be: Restrain the voluntary efforts at expulsion till the cervix is ready for the passage of the head, avoid the accumulation of urine in the bladder, and never permit the cervix or anterior vaginal wall to present beneath the symphysis. Any tendency in this direction should be met by prompt restoration and watchful support.

Prophylaxis has its place also in cases in which subinvolution is threatened or exists. The puerperal woman is entitled to this care and attention before she is dismissed by her obstetric attendants.

Symptoms.—The symptoms of cystocele consist in distress and discomfort due to a protruding mass at the vulva, a dragging sensation in the pelvis, frequent desire to urinate, with unsatisfied sensation, because of incomplete accomplishment. That part of the bladder composing the cystocele remains on a lower level than the point of exit, and having no detrusor muscle is incapable of discharging its contents. Later, when decomposition of retained urine has occurred and the subsequent symptoms of cystitis, calculus, ureteritis, pus in the kidney, etc., have developed, the serious consequences of the original condition becomes convincing.

Treatment.—The early procedures for the relief of cystocele consisted simply in building up a strong perineal body that should retain the prolapsed tissues within the vulva. Simon practised this for many years, but his experience developed the fact that this method was only a temporary expedient; the weight of the sustained mass and intraabdominal pressure gradually absorbed the artificially-constructed dam and allowed the former condition to be reproduced. Marion Sims brought his original concepts to bear directly on the offending tissues, and devised the procedure known as anterior colporrhaphy. Emmet followed the suggestion of Sims, and improved on it, modifying in various ways the denuded surfaces, with the idea of building up a resisting line of tissue that should act as a lever in holding the cervix high in the hollow of the sacrum. E. C. Dudley shifted the seat of operation to the lateral sulci of the vagina in the operation that he denominates "lateral elytrorrhaphy." Stolz' operation, the purse-string suture about an elliptically denuded surface in the center of the protruding mass, has had considerable popularity. This is due more to its simplicity than its efficiency. In addition to its temporary character, it introduces a most objectionable element, viz.: the shortening of the anterior vaginal wall, the baneful consequences of which are universally recognized.

All of these procedures utterly fail in grasping the true cause of the difficulty and attacking it on rational principles. Granting that a cystocele is a hernia, it would seem quite as rational a procedure and give promise of quite as satisfactory results to denude the skin over an inguinal hernia and bring its edges together with stitches as to expect to cure a cystocele by simply denuding the vaginal mucous membrane, tucking in the pro-

lapsed bladder, and stitching together the freshened edges of the mucous membrane. The fascia is the sustaining tissue, and if there has been a pocket or hernia produced in it by overdistention until it has lost its power of recovery, the only permanent relief consists in cutting out the overdistended and atrophied area of fascia and bringing into apposition the strong, well-nourished areas beyond, that have not been subjected to or have resisted the destructive pressure.

Reynolds of Boston lays stress on the importance of cutting out the weakened overstretched fascia. His idea is to obtain support also from the anterior vaginal wall by fastening its upper end to the bases of the broad ligaments at either side of the cervix uteri. This is accomplished by swinging around in front of the cervix the bases of the broad ligaments, attaching them, together in the middle line and connecting this common point with the vaginal fascia in line with the urethra.

All these operations, even those that recognize the analogy between a cystocele and a hernia, as Reynolds does, are open to the objection that by tucking up or invaginating the excess of bladder wall and then diminishing the size of its inclosing fascia, the base of the bladder is thrown into multitudinous folds in various directions. In the pockets of these folds the urine accumulates, is retained, undergoes decomposition, and is apt to inaugurate an unfortunate train of sequelæ, such as cystitis, calculus, ureteritis, pyelitis, etc.

Method of Operation.—It has been my endeavor, in the procedure which I offer, not only to accomplish all that any other operation fulfills, viz., to provide a good strong support for the bladder below, but also to restore its suspensory supports above and to do away with the redundant folds of bladder wall at its base.

In diminishing the size of the inclosing fascia, as stated above, not only is there a redundancy of tissue from side to side, but also anteroposteriorly. This can be obviated by dissecting the bladder entirely free from its attachments to the uterus, the broad ligaments and the vagina, rotating the entire organ on its transverse diameter, and spreading out the excess of bladder wall in the cystocele on the face of the uterus and the broad ligaments.

The anterior vaginal incision, as employed in vaginal section for the relief of diseased ovaries and tubes, and retrodisplace-

ment of the uterus, affords every opportunity for accomplishing this procedure. This became strikingly apparent to me in a case in which I was operating for the relief of these conditions. The case was one of those multiple injuries resulting from childbirth, in which there was present laceration of the cervix and perineum, rectocele, cystocele, retroversion of the uterus with prolapsed and adherent appendages. After the uterus had been curetted, trachelorrhaphy performed, the anterior vaginal incision made, the ovaries and tubes treated, and the fundus uteri restored to its normal position by shortening the round ligaments, the bladder, which pouted through the vaginal incision, was rotated on its transverse diameter, and its base carried up onto the anterior face of the uterus and stitched there with chromicized catgut. This took in all the slack in the anteroposterior line of the base, and by stretching out first one side of the bladder and then the other and stitching it on to the respective face of the broad ligament, the lateral folds were also obliterated. The pouting sac entirely disappeared. It only remained, then, to make the vaginal wall fit this new position of the bladder. This was accomplished by cutting away all the overstretched vaginal sheath and membrane at either side of the longitudinal vaginal incision and bringing together the bare strong facial edges with interrupted catgut sutures. This made the vaginal wall fit snugly against the base of the bladder, and it was at once apparent that the anterior vaginal wall, instead of sagging into the lumen of the vagina, maintained a straight line from the pubis to the cervix uteri. Perineorrhaphy was then performed to relieve the rectocele, and the result was all that could be desired.

In order to understand the thoroughness of this work, it is necessary to keep in mind the method of making the anterior vaginal incision. A cross incision, slightly curved or straight, is made in front of the cervix, as in vaginal hysterectomy. From the middle point of this a second incision is made at right angles to it down the entire length of the anterior vaginal wall. These incisions go through the fascia down to the bladder wall. The bladder is then dissected widely and freely from the interior of the fascia on either side of the median line till the entire organ is set quite free throughout its entire base and sides. The vesicouterine pouch is then entered and the peritoneum torn across the face of the uterus and well out on to the face

of the broad ligaments. The bladder is stitched by an interrupted suture of chromic gut at three points only, the middle of anterior face of the uterus and two points on the broad ligaments sufficiently wide apart to spread out the bladder wall. The method of passing the sutures is important: The sutures are all passed and left sufficiently long to protrude from the vulva before any one is tied. When all three are in place the middle one is tied first, then the others.

The principle involved here is that which Nature has employed in sustaining all the organs of the human body, viz., suspension from above. The bladder in this operation is carried up and suspended from the uterus and broad ligaments. In addition to this the true method of treating a hernia is also brought into requisition.

To apply this principle in detail to all cases of cystocele, it is necessary to classify them in accordance with the etiology. In virgins and nulliparous women, as a rule, the uterus, *i.e.* the fundus, remains in place. Exceptions to this appear in instances of prolapsus, but these are rare. The etiology consists in an elongation of the supravaginal portion of the cervix, due to hypertrophy of the uterine tissue. This permits the descent of the points of support, at the upper end of the vagina, producing a sagging of the vaginal wall and the base of the bladder. In these cases there may or may not be a hernia of the bladder through the vaginal sheath. There is prolapse of all the vaginal wall accompanied by the bladder. In many of these cases the primary hypertrophy of the supravaginal cervix is confined to the anterior lip. In these instances there exists a protrusion of the anterior vaginal wall with the bladder behind it, but unaccompanied by a rectocele. In the first variety of this class of cases the entire attachment of the upper end of the vagina must be cut away, the elongated cervix amputated, and the attachments of the vagina shifted to a higher level. If it is of long standing and a hernia of the bladder exists, the uterovesical attachments must also be lifted to a higher level and the details of the operation, as previously described, applied. If only the anterior lip is hypertrophied, of course only the anterior attachments of the vagina to the uterus need to be dealt with. In both classes of cases, however, great facility is afforded by the transverse and longitudinal incisions and free dissection of the bladder from the vagina and uterus.

The most common cases of cystocele are found in multipara, and associated quite uniformly with descensus and retroversion of the uterus. In these cases it is necessary, before attacking the cystocele, to restore the uterus to its normal position and secure for it sufficient support, not only to maintain that position for itself, but also to support the bladder. It must be borne in mind, however, that the higher attachment of the bladder operates equally in lifting the bladder to a higher level and maintaining the uterus in its normal anteverted position.

This procedure is applicable to all cases of this class in which the condition is not so extreme or of so long standing as to have robbed the connective tissue of all recuperative power. Extreme cases, however, are surprisingly restored by this operation, when even a more radical procedure seems indicated; or by the restoration of normal circulation and nutrition the sustaining power of the connective tissue is regained and a normal healthy condition established. The extreme cases in which hysterectomy, extreme vaginal fixation of the uterus, or complete removal of the uterus and appendages, together with the entire vagina, panhysterocolpectomy, as described by Edebohls, do not come within the scope of our consideration in this procedure.

I have performed this operation between thirty and forty times, all with most satisfactory results. The first case was operated on in September, 1902.

Operation.—September 24, 1902. Uterus was curetted and packed with gauze; the lacerations of the cervix were repaired, and the round ligaments shortened through the anterior vaginal incision. In making this incision the bladder was dissected entirely free from the vaginal sheath and fascia well out at either side. The vesicouterine peritoneal fold was pierced and the peritoneum torn across well out on to the surface of the broad ligaments. To relieve the cystocele the bladder was then rotated on its transverse diameter and stitched in the following manner: A point was selected in the middle line of the base of the bladder wall which could be carried up to the torn edge of peritoneum on the anterior surface of the uterus, middle point, and by so doing take up all the slack in the base of the bladder, making a comparatively straight line from the urethra to the uterus. Through this point a suture was passed and carried also through the selected point on the anterior

face of the uterus. The suture was of chromicized catgut No. 2. It was left long and was not tied. Two other points in the base of the bladder were then selected, one at either side, on a transverse line with the first and about equally distant. Through each of these a similar suture was passed and carried through a point on the torn-off edge of peritoneum on the surface of either broad ligament, sufficiently wide at the middle line to take in all the slack in the base of the bladder from side to side. These sutures were also left long. The three sutures were then tied successively, beginning with the middle one. The effect of this was to stretch the base of the bladder taut and smooth in every direction. The fascia along the middle line of the vaginal incision and the mucous membrane as well were then trimmed off sufficiently to make them fit the base of the bladder snugly, and were stitched with interrupted sutures of chromicized gut. The perineum was also repaired. The vagina was gently packed with gauze and the patient put to bed. Convalescence was afebrile, smooth, and comfortable.

A REVIEW OF THE OPERATIVE TREATMENT OF CYSTOCELE IN THE PAST ONE HUNDRED YEARS.*

BY

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(With sixteen illustrations.)

THE idea of constricting the vagina so that the resulting diminution in caliber should minimize or remove the supposed downward traction on the bladder, early suggested itself to several brilliant minds endeavoring to cure this distressing condition, which must have been even more common in their time than it is in ours. Thus, as early as the beginning of the nineteenth century we find Jobert (Fig. 1) reporting three cases where he had applied caustic over a considerable area of the anterior vaginal wall until the mucous membrane was de-

*Read before the New York Obstetrical Society, May 8, 1906.

stroyed, and then drawing the edges of the wound together and holding it in place by straight needles and twisted sutures.

To Gerhardin is probably due the credit of the first operative

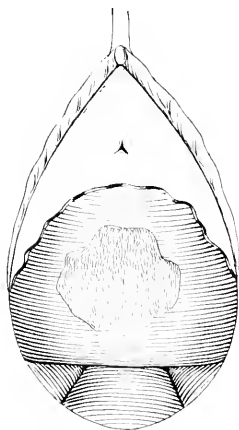


Fig. 1.—Jobert.

denudation of the anterior vaginal wall for the relief of cystocele. In 1823 he made the suggestion to the medical society of Metz, and the following year performed his first operation

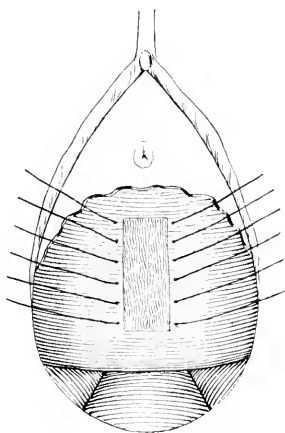


Fig. 2.—Gerhardin, 1823.

(Fig. 2), consisting in the removal of a longitudinal strip of mucous membrane from the anterior vaginal wall and the closure of the wound with interrupted sutures.

He was closely followed by Diffenbach, Hemming and Velpeau, who used oval denudations in place of longitudinal ones; and Marshall Hall, who removal a triangular piece of tissue with its base directed toward the vaginal orifice.

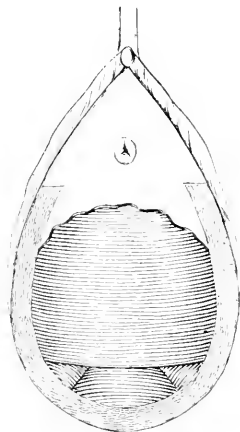


Fig. 3.—Lightfoot, 1841.

After a short vogue these denudation operations were abandoned until revived by Marion Sims in 1858. Lightfoot of

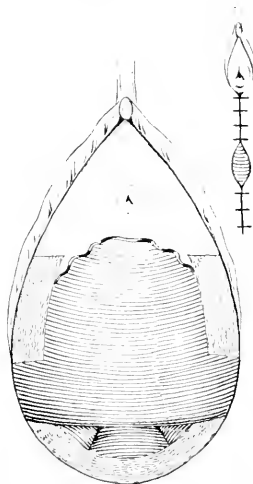


Fig. 4.—Baker-Brown, 1853.

England, in 1841, denuded and sewed together the whole vaginal orifice, omitting only a small portion at the meatus to keep the canal patent (Fig. 3).

Baker-Brown of London, in 1853, reported an operation (Fig. 4) consisting in the removal of a strip of mucous membrane posteriorly and two vertical strips anteriorly, just inside

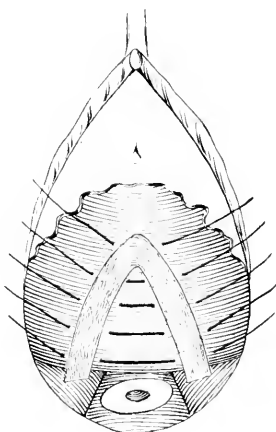


Fig. 5.—Sims, 1858

of the vaginal orifice, thus forming, after union had taken place, a bridge of tissue on which the cystocele rested and from which it was supposed to derive support.

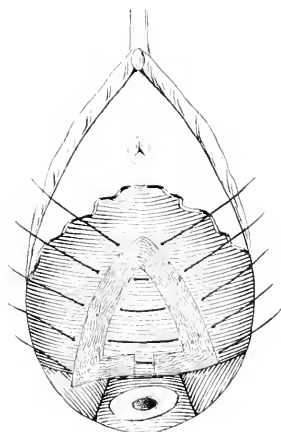


Fig. 6.—Emmet.

Marion Sims in 1858 denuded a horse-shoe bit of tissue from the anterior vaginal wall, which operation (Fig. 5) was later modified to some extent by Emmet (Fig. 6).

Stolz of Germany about this time advocated the removal of a circular area of mucous membrane (Fig. 7) with closure of the raw surfaces by a purse-string suture—an operation still enjoying considerable popularity.

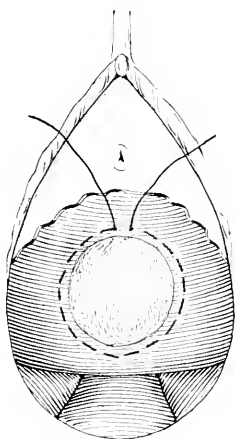


Fig. 7.—Stolz.

In 1887 Hadra of this country (Fig. 8) advocated the separation of the bladder from the cervix and the anterior vaginal wall. The viscus was then elevated and the freed vagina

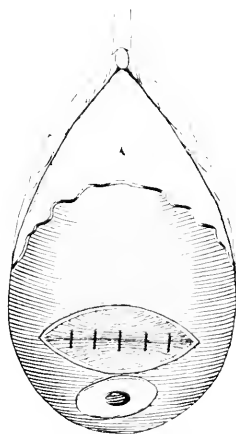


Fig. 8.—Hadra, 1889.

stitched to the anterior uterine wall as far up as the waist of the uterus. He operated through a crescentic incision on the anterior vaginal wall, just above and parallel to the cervix.

Two years later he recommended the excision of the redundant tissue in the vaginal wall.

Skene, in 1892, through a small opening in the anterior vaginal wall at the juncture of the urethra and bladder, separated

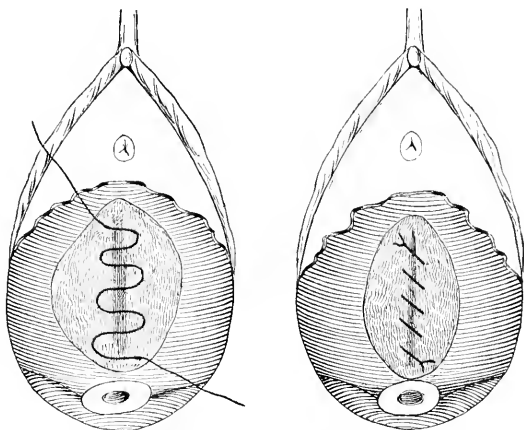
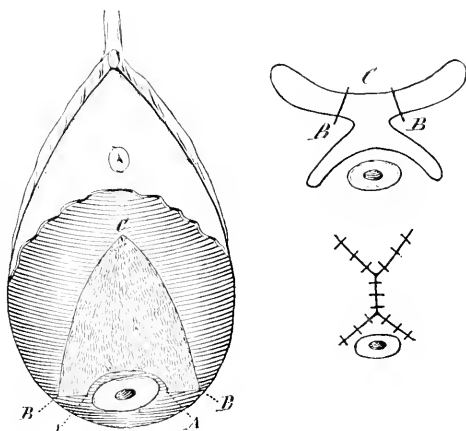


Fig. 9 and 10.—Gersuny, 1897.

by blunt dissection the bladder from the vagina to the extent of the hernial opening. The bladder was then elevated and the lateral edges of the muscular layer of the vagina were brought



Figs. 11 and 12.—Reynolds, 1902.

together with sutures, thus developing a ridge of mucous membrane projecting into the vagina, which should also serve as a supporting bridge of tissue for the bladder.

Gersuny, in Germany, in 1897, made a median incision (Figs. 9, 10) in the anterior vaginal wall from the bulbous urethra to the anterior lip of the cervix. Through this he detached the

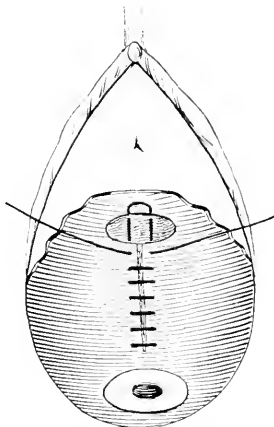


Fig. 13.—Dudley, 1903.

bladder far back on both sides to the border of the cystocele. The bladder was then infolded and so retained by a continuous suture passed through its muscular walls. Over this the vag-

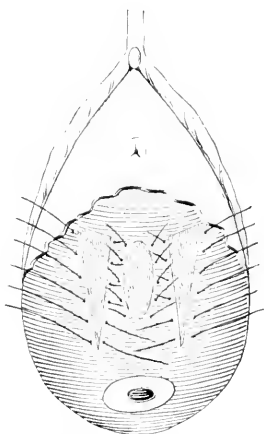
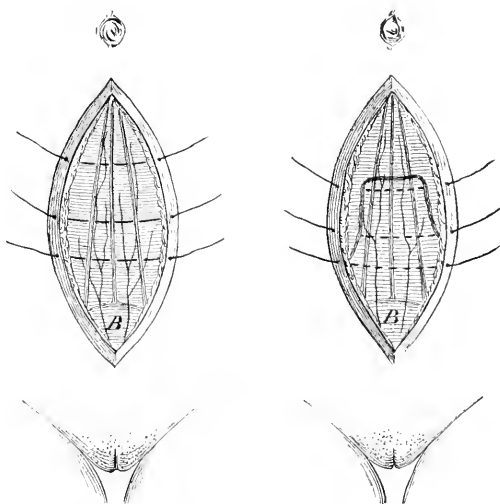


Fig. 14.—Hirst, 1904.

inal flaps were then sutured. Martin later sought to accomplish this same infolding of the bladder by passing several rows of interrupted sutures, one over the other.

T. I. Watkins, in 1899, published a vaginal operation similar to that advised by Hadra in 1887, but he went a step further. After making a circular incision in the anterior vaginal wall, the bladder was separated from the uterus by blunt dissection, the peritoneal cavity opened, the bladder elevated, and the anterior wall of the uterus pulled forward. The vaginal flaps were then sewed to the fundus and broad ligaments far out on either side of the uterus. The use of this operation he advocated only in patients past the menopause.

Edward Reynolds of Boston, in 1902, seeking to utilize the natural support of the anterior vaginal wall, excised the over-



Figs. 15 and 16.—Lawson, 1895.

stretched portion (Figs. 11, 12), beginning just above the cervix and extending well up to the urethral orifice.

E. C. Dudley of Chicago, in 1903, incised the anterior vaginal wall longitudinally from the cervix to within one inch of the meatus (Fig. 13). The vagina was then separated from the bladder and the thinned-out portion excised.

In 1904 Goffe presented to this Society an entirely new procedure. Through a longitudinal incision in the anterior vaginal wall the bladder was separated from the vagina and uterus, the peritoneal cavity opened, and the bladder elevated and stitched to the broad ligaments on either side. The thinned-out

portion of the anterior vaginal wall was then excised and the borders sutured together.

The pioneers in the operative treatment of cystocele by the abdominal route were Byford, Lawson, Tuffier, Demoret and Laroyenne.

Byford, in 1890, reported his inguinal suspension or colpocystorrhaphy. Cutting down into the posterior pubic cellular tissue, through the inguinal canal, he passed a suture of silk-worm gut down through one border of the inguinal canal, and catching up the anterior vaginal wall, which he transfixed at the sulcus, brought the stitch out through the opposite border of the inguinal canal. This was tied tightly, thus pulling up the anterior vaginal wall and with it the bladder, closing at the same time the opening in the inguinal canal.

In the same year Demoret and Laroyenne published their operative methods for fixing the bladder to the abdominal wall extraperitoneally, while Tuffier, advocated an intraperitoneal method.

Lawson of England, in 1898, by means of an abdominal incision through the skin, fascia and rectus muscle, exposed the subperitoneal fascia, shortened the urachus and hypogastric cords and sutured them (Fig. 15) to the rectus sheath. Finding, however, much anatomical uncertainty regarding these structures, they frequently being nearly obliterated or entirely wanting, he then incised the peritoneal fascia and peritoneum from which he cut a flap extending down to its reflection onto the bladder. Pulling on this, the bladder was elevated as high as necessary and retained in place by suturing the peritoneal flap (Fig. 16) to the common sheath of the rectus. Twenty-five cases were reported, with excellent results.

Dickinson of Brooklyn, in 1903, presented his operation of ventral suspension and fixation for prolapse of the bladder and uterus, performed through a median incision.

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THE CONSTRUCTION OF A NEW VAGINA.

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(With 15 illustrations.)

(Continued from page 331.)

IN attempting to study the prognosis in cases of artificially constructed vaginæ we are met, at the outset, with the unfortunate fact that most operators have contented themselves with giving their immediate results and have frequently failed to report the condition of the new canal after a sufficient period of time has elapsed. We are absolutely sure of the prognosis of those cases in which the immediate result was unfavorable; but those cases reported as favorable leave a serious margin of doubt. Still, we have tabulated a number of these cases with the results as found after a lapse of several months or years.

Operator	Method	Lapse of Time	Result
Villaume.....	Blunt Dissect'n.	2½ years.....	Canal still present.
Fletcher.....	" "	Several.....	Good. Gave birth to two children.
Debrou.....	" "	Several years.	Good, but mother and child lost during forceps delivery for eclampsia.
Delbeau.....	" "	5 years.....	Gave birth to child at end of this period.
Villar.....	" "	6 months....	Good (?), but was wearing rubber cylinder and patient subsequently married.

Leopold.....	Blunt dissect'n.	More than a year.....	Good, and patient subsequently married.
Berrut.....	" "	5 years.....	Fairly good. Stricture found, but overcome by dilatation. Some contraction at this time. Patient married.
Henrotin.....	" "	Several years.	Good. Gave birth to a child.
Smith ⁸¹	" "	Several mos.	Failure. New canal closed.
Breisky (3 cases).....	" "	.....	One complete failure.
Boldt (3 cases, verbal communication)	" "	Several mo's.	Failures.
Heppner.....	Flaps.....	Several years.	Good.
Crédé.....	"	More than a year.....	Successful.
Delagenière.....	"	Several mo's.	Fair. Canal became shortened 1 cm.
Azema.....	"	More than a year.....	Contraction began at 6 weeks; still pervious at end of a year.
Tuffier (1895).....	"	Several mo's.	Failure.
Segond.....	"	" "	Failure.
Lenger.....	"	" "	Good.
Bode (3 cases).....	"	" "	Failure.
Beck.....	"	" "	Good; later, husband deserted his wife.
Vantrin.....	"	3 years.....	Canal shrunk from 8½ cm. to 5 cm.
Fleming.....	"	1 " "	Complete success.
Violet.....	"	1 " "	Good.
Schalita.....	Transplantation	Several mo's (or years?).	Good.
Küstner.....	"	Several years.	Fairly good. Scar exsected after 1½ years, and flaps used.
Sventsitsky.....	"	6 months....	Satisfactory.
Mackenrodt (2 cases).....	"	Several mo's (or years)....	Good.
Abbe.....	"	Several mo's.	Good, patient married, but tendency toward shrinkage.
Isaacs.....	"	Several mo's.	Good.
Author's case.	"	" "	Good.
V. Ott.....	Flaps and Vag'l celiotomy....	1½ years.....	Good.
Walton.....	Flaps and Vag'l celiotomy....	Several mo's.	Good. Patient married later (?). Operation 3 years previously a failure.
Broca.....	Abdom. Section & Blunt Vag'l Dissection....	After 5 years.	Failure after two operations
Heinricius.....	"	.....	Injured bladder.
Oui.....	"	Several mo's.	Failure.
Villemin.....	"	" "	Failure.

Tuffier (2 cases).....	Abdom. Section & Transpl'n.	Several mo's.	
Hofmeier.....	Abdom. Section, Suture of cerv. to rudim. vag.	" "	Good.
Pfannenstiel.....		3 years.....	Good.
Vineberg.....		5 months.....	Good.
Sneguireff (3 cases).....	Utiliz'g rectum.	After several months to 12 years...	Good.
Gersuny (3 cases).....	Utiliz'g rectum with trans-plantation...	Several mo's to several years.....	Good.
Federow.....	Utiliz'g rectum.	?	Immediate result satisfactory.

Briefly summarizing these facts we find that in nineteen cases, in which blunt dissection was alone resorted to, there were 9 failures, 9 successful and one doubtful result. In 16 cases, in which the raw vaginal surface was covered with flaps, there were 5 failures, 8 successful and 3 doubtful results. In 10 cases, in which grafts of skin or mucous membrane were transplanted, there were one failure and 9 successful results. In 6 cases, in which the rectum was utilized by the Sneguireff or Gersuny methods, there were no failures. Tabulated we get the following percentages in their order of success:

PERCENTAGES OF SUCCESS AFTER THE DIFERENT
METHODS OF OPERATIONS IN 51 CASES.

Utilizing the Rectum (Sneguireff or Gersuny)....	100.00%
Transplantation of Skin or Mucous Membrane..	90.00%
Pediculated Flaps.....	68.75%
Blunt Dissection.....	53.00%

If the methods of utilizing the rectum did not present such serious theoretical objections, we would not hesitate to pronounce them as worthy of our first choice. Fortunately the results following the transplantation of skin or mucosa are nearly quite as good, and being free from the necessity of mutilating so important a contiguous structure as the rectum, we feel that operators should adopt this method. The flap method ranks next in importance, while the method of blunt dissection should be regarded only in the light of a temporary or emergency procedure or as the first stage of the operation.

Some operators, like Mackenrodt,⁷⁸ are positive in their view that transplanted grafts should consist only of mucous membrane, claiming that the transplanted-skin cases inevitably lead to subsequent shrinkage of the new canal. The cases, however, of a successful result, where skin grafts were used, are sufficiently numerous to justify the use of the Thiersch method, particularly as the grafts can always be obtained from the same patient, whereas mucous membrane flaps must usually be secured from other sources.

We are now ready, after this rather extensive survey of the subject, to summarize and to lay down rules for future guidance in the management of this interesting condition. The indications for operative treatment will fall broadly under one of two headings: I.—Operations for the partially or completely absent vagina, in which the uterus and adnexa are more or less developed and functioning; II.—Operations for the absent vagina, in which the uterus and adnexa are either completely absent or in a rudimentary (nonfunctioning) condition.

I.—Operations for the partially or completely absent vagina, in which the Uterus and Adnexa are more or less developed and functioning.

These cases embrace for the most part the acquired forms of absent vagina. Whilst the inability to perform the sexual act may be an important element in these cases, it is apt to be overshadowed by vastly more important considerations—principally the retention of menstrual blood in the upper portion of the vagina, in the uterine cavity, or in the Fallopian tubes. The defect may be present as:

a.—An atresia of the vagina due to a ring of fibrous tissue of varying thickness; or

b.—As an obliterated canal through which the smallest probe can barely be passed; or

c.—As a rectovaginal septum with not the faintest trace of a canal.

A.—The operations which may be done from below without invasion of the peritoneal cavity, are as follows:

a.—The constricting rings may be attacked in one of three ways: (1) by gradual dilatation with metallic sounds or valvular specula; (2) by radiating incisions through, or exsection of the fibrous ring, followed up with gradual dilatation; (3) by exsection of the fibrous ring with suture of the upper segment of

the vagina (or cervix) to the lower segment or to the vulvar orifice. The last is the method of choice and was used by Martin, Schwartz, Polosson, Balzevitch, Vineberg⁷⁹ and others.

b.—In cases of obliteration of the vaginal lumen (partial or complete): (1) the immediate indication, again, will be to open up the canal and permit of the escape of retained blood in the upper vagina or uterus and to keep the new canal patent by the various methods of dilatation, until (2) measures can be taken to keep the canal permanently open; or both stages of the operation may be done at once.

The first stage will consist of the construction, by blunt dissection, of a new vaginal canal after the method of Dupuytren, Amussat and of nearly all subsequent operators, care being taken not to injure the bladder or the rectum.

The second stage of the operation implies a guarantee against the closure of the new canal. It consists of covering over the newly-made raw surface with a layer of mucosa or skin either by means of pediculated flaps or transplanted grafts. The best flap operations should be based on the methods and technique of Heppner, Credé, Guillet, Anderson, and Fleming, which have been described in the earlier portion of this paper. The raw surface may also be covered over with transplanted epidermis (Thiersch grafts) or mucosa after the technique of Schalita, Küstner, Mackenrodt and Abbe. It is questionable whether the method of securing the mucosa from lower animals, like the rabbit (as in Svetsitsky's case), will ever be generally adopted.

B.—The operations done from below with invasion of the peritoneal cavity through the vaginal wound permit of the direct exploration of the uterus and adnexa and are based on the methods of v. Ott, Walton and others. Thus Walton was enabled to dissect the cervix out of its fibrous surroundings, and, after amputation, to suture the vivified cervix to previously prepared flaps below. Czempin removed a rudimentary uterus and the only ovary present, covering over the raw surface with grafts a week later. Von Ott removed a fibroid uterus by morcellation and sewed the edges of the peritoneal wound to flaps drawn into the vaginal canal from below.

C.—The operations done from below with invasion of the peritoneal cavity through an abdominal incision will be properly

indicated in cases in which there is distinct evidence of hematometra, possibly in conjunction with hematosalpinx, or in such cases in which it may be desirable to make a careful exploration of the adnexa with the probability of their removal, in addition to the construction of a new vagina.

After opening the abdomen, the peritoneum between the bladder and the uterus should be incised and these organs separated from one another, so as to leave a space, which is to be the upper continuation of the newly-made vaginal canal. The uterine cavity should next be opened (if the os is not patent), allowing pent-up blood to escape. Tuffier now sews Thiersch grafts over a catheter, which he places in the uterine cavity, drawing the lower end through the newly-made vaginal canal. The catheter is secured above and at the vulvar orifice, with sutures and is removed after several days, leaving the grafts adherent to the raw surface. Pfannenstiel, Hofmeier, and Vineberg sew the cervical or uterine opening or upper segment of vagina directly to the rudimentary vagina below.

II. *Operations for the Partially or Completely Absent Vagina, or Non-functionating Uterus and Adnexa.*

This group of cases, which is represented exclusively by the congenital type, calls purely and simply for the construction of a vaginal canal for the purpose of copulation. Although there has been opposition on the part of some to the idea of constructing a canal for this sole purpose, many of the greatest surgeons throughout the world have devoted their best thought and talents to this problem and have devised the most ingenious operations to overcome the defect. This subject has been so thoroughly gone into in the first portion of this paper that we content ourselves here with extracting the principles underlying the numerous operations done for its relief.

1. The construction of a new vaginal canal requires (a) the boring of a passage between the rectum and vagina by blunt dissection, and (b) the lining of the new canal with epidermis, skin, or mucosa. To prevent the shrinkage of the new canal from above, the plan resorted to by Isaacs and the writer seems to offer the best results. Beck's ingenious operation may be done; but it is questionable whether it has any great advantages over the transperitoneal route beyond the circumstance that there is no invasion of the peritoneal cavity.

2. Utilizing the rectum or a longitudinal segment from its

anterior wall (after the methods of Sneguireff and Gersuny) seems to give a canal of permanent character. Down to the present time most surgeons have shrunk from these operations, which imply either a transplantation of a newly-made anus (Sneguireff) or a narrowing of the normal caliber of the rectum (Gersuny). Still, cases like that of Terrier,⁸⁰ in which this surgeon refused to operate because of the apparently insuperable extent of the defect, may arise in which even these operations may have their place.

We cannot close this paper, if it is to be fairly exhaustive, without alluding to one more class of cases in which the absent vagina is associated with functioning uterus and adnexa in young persons or unmarried women, in which the question of sexual congress does not enter at all. Thus, a functioning ovary may give rise to crises of a periodic character, causing much suffering and justifying its removal by abdominal section. Or cases of hematometra with hematosalpinx and peritonitis occur in young girls or women which similarly indicate their relief by abdominal section. Down to the year 1896 not more than fourteen salpingo-oöphorectomies had been reported for these indications. It need hardly be said that in these cases the construction of a new vaginal canal does not come up for consideration; or, at all events, such operations should be postponed to a later date.

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112 EAST SIXTY-FIRST STREET.

A FATAL CASE OF ECLAMPSIA, AFTER THE DELIVERY OF TWINS; REMARKS ON THE ETIOLOGY AND PATHOLOGY OF THE DISEASE.*

BY

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WHILE the pathologic findings in this case are not altogether easy of interpretation, still they are significant. It is only by a careful detailed study of every case of eclampsia coming to our notice that we may ever hope to ascertain the real cause or causes of this obscure disease.

Gynecologic No. 1235. Miss B., age 16, German, single, schoolgirl. First pregnancy. First seen in the eighth month of gestation.

Family History.—There have been numerous twin pregnancies in both paternal and maternal families.

Personal History.—Negative. Has always been well and strong.

Examination (April 22, 1905).—The patient is well nourished and weighs one hundred and twenty-five pounds. There is moderate edema of the ankles. The skin, mucous membranes and joints are normal. The lateral lobes of the thyroid gland are moderately prominent. There is increased vesicular breathing over both lungs. The area of cardiac dulness is pushed upward. The valve sounds are normal. The radial pulse is 80.

Special Examination.—The breasts are markedly enlarged, showing striæ; the areolæ and nipples are negative. The abdomen is greatly distended from the pubes to the ensiform, be-

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ing more prominent than the normal full-term pregnancy. The striæ are very numerous. A transverse furrow or depression at the level of the umbilicus separates the enlargement, superficially, into two unequal eminences, the upper being the larger. The fetal small parts are very prominent on both sides. Two fetal hearts can be located, one in the upper right, the other in the lower left quadrant: rate, 142 and 135, respectively. Vaginal examination shows the usual signs of pregnancy. The blood and urine examinations reveal nothing abnormal.

May 4, twelve days later, at 9 A.M., the patient began to have rather severe labor pains, accompanied by nausea and vomiting of a mild grade. She was kept in bed and given morphine. After a short remission the pains came on again. May 5, 8 A.M. For the last twelve to fourteen hours the pains had not been strong. As the patient had passed no urine during this time, she was catheterized and 1,000 cubic centimeters of clear urine obtained, which, on examination, showed no precipitate on boiling and adding nitric acid. Heller's test was negative. The urea estimated at .3 gram per 100 cubic centimeters, or 3 grams in twelve hours. Neither casts nor blood were present. At this time it was noted that the patient answered questions with hesitation and appeared somewhat stupid. Three hours later, vaginal examination showed the os dilated to admit three fingers, membranes unruptured, head of the first fetus at the level of the superior strait. The membranes ruptured about 2 P.M., and shortly afterward the feet of one fetus were found prolapsed, the head of the other presenting at the inlet. The patient was anesthetized and prepared for operative delivery. The os was dilated manually, and the prolapsed extremities pushed up. The small presenting head was fixed in the pelvis by suprapubic pressure, in an O.L.A. position, high forceps applied and the child delivered without difficulty. The second child was extracted by the breech; both were females. Respiration was induced only after prolonged effort. The single placenta came away entire. A slight perineal tear was repaired at once.

One hour after delivery the mother had a typical eclamptic convulsion. Consciousness had not been regained. Croton oil was given, salt solution was administered by hypodermoclysis and by rectum, and veratrum viride tried. The con-

vulsions, however, recurred rapidly, chloroform even not fully controlling them. In spite of all that could be done, the patient died within ten hours after delivery, having had between thirty and forty convulsions.

Examination of the urine obtained by catheter four hours before death was as follows: Color, pale; slightly turbid; specific gravity, 1.007; reaction acid. Albumin (heat and nitric acid), 1-5 by volume; urea, .35 gram per 100 cubic centimeters; few red blood cells; few leukocytes; a small number of granular casts.

It is of interest, in its possible etiologic relationship to the eclampsia of the mother, to note that both children developed a marked icterus, which disappeared very slowly. Both lived.

Autopsy ten hours after death, by Professor A. S. Warthin.

Brain.—No evidences of thrombosis. Brain tissue soft. Marked edema; section shows edema and congestion.

Heart.—Pericardial fluid increased. Valve flaps negative. The auricles contain white agonal clots.

Lungs.—Pleuræ negative. Marked congestion and edema. No thrombosis or embolism.

Liver.—Capsule negative. The whole organ is enlarged, especially to the left. Consistency, rather soft. Central veins congested. Peripheral portions of the lobules are light and have a slight fatty shine.

Spleen.—Congested.

Kidneys.—Edematous and congested. Both ureters somewhat dilated; more marked on right side, especially above the pelvic brim. Both pelves dilated and chronically thickened.

Intestines show lymphoid hyperplasia and congestion.

Thyroid.—Lateral lobes somewhat enlarged; right lobe, 4 x 2 x 1.5 cm.; left lobe, 4.5 x 2 x 1 cm. The isthmus is very narrow, being represented by a small bridge of tissue. Neither external nor internal parathyroids are found.

Hemolymph nodes and retro-peritoneal glands hyperplastic and edematous.

Uterus, Ovaries, Etc.—The uterus is enlarged. The interior shows the results of a recent delivery. Small amount of bloody lochia. Cervix large and soft, os patulous. Both ovaries normal, right contains corpus luteum of pregnancy. Vagina and vulvar opening relaxed and edematous.

Microscopic examination.

Lungs.—Markedly congested. Marked embolism of bone marrow giant cells. Syncytial "giant cells" in small numbers.

Liver.—Practically normal. Slight fatty infiltration. No evidence of necrosis. No thrombi.

Kidneys.—The most marked change is a necrosis of the tubular epithelium in certain areas. Professor G. C. Huber has very kindly identified for me the location of this change and, according to his opinion, the distal portion of the proximal convoluted tubules is the seat of the lesion. In other parts of the uriniferous tubules, there is slight cloudy swelling and, in places, a very moderate desquamation of the epithelium. There is only a slight inflammatory change. A small amount of granular material can be found in a few of the tubules. No albuminous material in the glomerular capsules. Few round cells in the interstitial tissue. A small number of tube casts are present.

Thyroid.—The colloid is much decreased and, in many places, takes the eosin stain only faintly. Most of the alveolar spaces contain no colloid and the epithelium forms papillary folds or irregular projections. Many of the alveoli are filled with desquamated cells.

There are so many conflicting opinions expressed by different authorities as to the cause of eclampsia that it had been termed by Zweifel, "the disease of theories." A brief review of these theories of origin I shall attempt to classify, roughly, under the following heads:

(1) *Kidney.*—Rayner, in 1839, found albumin in the urine of pregnant women having convulsions. A renal genesis of the disorder was at once suspected and the view is quite widely held to-day that the kidney lesions are the primary cause of eclampsia. Herzfeld and Mynlieff have resurrected Halbertsma's theory of mechanical interference with excretion of urine by compression of the ureters. Ahlefelder, however, last year reported a case of hydronephrosis at term from compression of a ureter, without eclampsia. In advanced carcinoma of the cervix it is well known that chronic dilatation of the ureters may produce no symptoms whatever. Many cases of eclampsia have been reported in which there have been no marked kidney changes and no albuminuria. (Charpentier, Schroeder, Bouffe de St. Blaise, Schmorl, Olshausen, et al.) On the other

hand, grave renal lesions may be present in the disease without albumin in the urine.

The renal changes in the majority of instances consist, according to Meyer-Wirz, in a parenchymatous degeneration of the cells of the tubules. In an analysis of 117 cases, there were old kidney lesions in eight. Inflammatory changes were rarely found. Bouffe de St. Blaise states that the kidneys in eclampsia show changes resembling the necroses in infectious diseases. Bell reports a case of eclampsia coming to autopsy in which there was a necrosis of the cells of the convoluted portion of the uriniferous tubules. The glomeruli were unaffected.

2. *Liver*.—While hepatic lesions were noted in many cases coming to autopsy and the cholemia of pregnancy had been described by Frerichs, who, with Rokitansky (1857), had observed the condition of acute yellow atrophy in pregnant and puerperal women, still no very definite view concerning the possible hepatic origin of eclampsia was advanced until Jürgens published his findings in 1886. He concluded that hemorrhagic necrosis was a more or less characteristic lesion in this affection. The almost constant presence of hepatic changes has been observed by many since this time, notable among whom are, Schmorl, Pillet, Bouffe de Sainte Blaise, Meyer-Wirz, Ewing, Stone, Edgar, and Williams.

In a rather recent article, Ewing lays stress on the changes in the liver in all cases of eclampsia coming to his notice. He makes a division of the disease into three classes, as determined by the type of hepatic lesion: 1. Hemorrhagic hepatitis: The liver is of normal size, and the surface and section show numerous hemorrhagic foci. Microscopic examination reveals marked degenerative changes with many points of necrosis. He says, "This lesion occurs practically without exception in all typical cases of acute fatal eclampsia at term, and in at least 95% of all cases of any variety of eclampsia. It is pathognomonic of this type of the disease." 2. Acute yellow atrophy: The liver is reduced in size. One section is mottled red and yellow, with hydropic and fatty degeneration of the central and intermediate zones, a surrounding area of necrosis, and externally a narrow peripheral zone of cells showing slight change. 3. Eclampsia with minimal hepatic lesions: In this class there are no gross changes. Microscopically there is a diffuse granular and fatty degeneration, foci of necrosis, and areas in which the

liver cells are distended with bile pigment. Stone concludes that the clinical characteristics of toxemia of pregnancy, eclampsia, and acute yellow atrophy of the liver "warrant the definite statement that they are one and the same disease." Williams doubts that these conditions are the same in etiology, but confirms the view that characteristic liver lesions are found in eclampsia. Those who believe that liver changes are primarily the cause of the disease have formulated the theory of "hepatic insufficiency," assuming that the functional failure of the liver results in an altered metabolism with the development of various grades of toxemia.

3. *Intestine*.—An intestinal origin of the poison causing puerperal convulsions has been suggested by a number of observers. (Budin, Chamberlent, Brown, Savory.) Constipation certainly seems to be a predisposing cause, but in cases of eclampsia it is not always met with and if it were the actual causative factor, convulsions of pregnancy would be the rule.

4. *Thyroid and Parathyroids*.—Lange (1899), in twenty-five cases of pregnancy without enlargement of the thyroid gland, noted in twenty the presence of albuminuria. When the thyroid was enlarged he found that the administration of thyroïdin caused a decrease in size of the gland. Nicholson, in a number of late articles, confirms Lange's observations and advocates the use of thyroid extract in eclampsia, reporting a number of cases so treated. It is believed the thyroid system has as a function the production of substances which neutralize the deleterious products of nitrogenous metabolism. Nicholson's theory may be summarized in his own words: "In some pregnant women, for reasons which are at present obscure, the supply of iodothyryn in the tissue becomes, gradually or suddenly, insufficient for the needs of normal metabolism. Coincidentally, certain toxic substances (intermediate or imperfectly converted products of nitrogenous metabolism) find their way into the circulation. These toxins, by their special property of contracting the blood vessels, eventually lead to the arrest of the renal secretion. With the suppression of urine, convulsions occur, and these do not seem to differ essentially from the fits of ordinary uremia. A deficiency of iodothyryn is the primary fault." Others suppose that there is a specific antitoxin formed in the thyroid system which neutralizes poisons generated in the placenta. Nicholson, in all his writings, however,

assumes much more than he demonstrates. For instance, one report deals with a case of ante-partum eclampsia in which thyroid extract was given after the patient had been delivered, the good recovery was attributed to the use of the thyroid preparation. Immediate delivery as a routine procedure has reduced the mortality from eclampsia in Zweifel's clinic from 28.5 per cent. to 11.25 per cent., so that the medication in the above case can not be said to have established even the possibility of a favorable result. However, many cases have been reported by various men with apparently much benefit from the use of thyroïdin. Vassale, Zanfrangini, and others, have recently employed parathyroid extract in certain cases of eclampsia, and here too, the results have been favorable. The function of the parathyroids is not at all understood. Vincent and Jolly, and MacCallum, from numerous experiments, show that removal of the thyroid alone produces symptoms which come on slowly, whereas removal of the parathyroids often gives rise to acute convulsive attacks followed by death. In the case now reported we failed to find any parathyroid tissue. Whether this is of any special significance I am not prepared so say.

5. *Placenta and Fetus.*—The ovular theory of eclampsia. It is believed by many, among whom are Dienst, Fehling, and Kehler, that toxins resulting from fetal metabolism find their way into the maternal circulation and give rise to eclampsia. Dienst, as a result of his experiments, concludes that in eclampsia there is an abnormal permeability of the placenta, which allows the fetal poisons to pass over into the mother's blood. The syncytium is thought, by Veit and Scholten, Schmorl, Meyer-Wirz, Behm, Graefe, and others, to produce the poison in eclampsia. This toxin is supposed to exert a hemolytic action and accounts for the thrombi found in the different organs. Time does not allow me to go into details, but the recent experimental work of Politi (1903), Capaldi (1903), and especially Liepmann (1905), regarding the toxicity of the placenta in eclampsia, is certainly suggestive. With all allowance for errors of technic, accidental infection, etc., it would appear that there does exist a placental toxin in eclampsia.

6. *Other Theories*, I can merely mention. The disease has been ascribed to circulatory disturbances in the brain, infection by bacteria, tumor-like proliferation of the syncytium, and lately,

Zweifel has found lactic acid in the blood, which he believes causes the convulsions.

The clinical and pathologic evidences certainly suggest a toxemic origin of the convulsions, but the toxin has never been isolated and the results of experiments directed with a view to show the presence of poisons in the blood serum and urine have been so inconstant as to make practically all the work along these lines of no value whatever. Bouchard, Volhard, Ludwig and Savor, Tarnier, Doleris and Butte, and others, appeared to demonstrate that poisonous substances exist in the blood and urine. However, Schumacher, Stewart, and Olivier showed that the methods employed were open to criticism, and themselves conducted experiments, with negative results. Semb, by a preliminary careful immunization of his animals against the toxic action of normal blood serum, has recently found that the injection of serum from eclamptics is fatal in a large majority of cases.

In the case now reported the most important points to be emphasized, are the absence of hepatic changes beyond those normally occurring in pregnancy, and the presence of the pathologic alterations in the kidney and in the thyroid gland.

The kidney lesion is a coagulative necrosis of the epithelial cells of the distal portion of the proximal convoluted tubules, with a beginning degenerative change in other portions, and slight acute inflammation. The renal changes may be explained on the ground that the toxin passes through the cells of the convoluted tubules, which, according to Ribbert, have some secretory function.

The significance of the change found in the thyroid is not at all clear. Whether it represents an over-activity, a condition of functional derangement, or a state of insufficiency, is problematic. It is possible that we are dealing with a case of exophthalmic goitre not recognized during life, although this does not seem probable. The changes resemble those found in Graves' disease, but are not exactly typical. It is now generally considered that exophthalmic goitre represents a hyper-activity of the gland or a condition of deranged function. The decrease in the amount of colloid might presuppose a diminished production of normal secretion, or, according to Lange's theory, a thyroid incompenstation. From a single case we can only theorize, and that with much mental reservation. By analogy,

however, it seems that we are dealing with a condition of hyperthyroidea. This hyperthyroidea may have been induced by an increased demand for thyroid secretion to act as an antitoxin to a poison formed in the placenta, which in the case of twins would, in all probability, be in much larger amount than in single pregnancies. The hyperthyroidea might then be only apparent and in reality an insufficient quantity of secretion formed for the particular needs of this individual. On the other hand an over-production of specific secretion might in itself constitute the real danger. This being the case, anti-thyroid medication would be indicated.

In drawing conclusions from this one case and from the literature, we may infer:

(1) That eclampsia is due to a toxemia, the origin of which is not known; but which, in the light of recent investigation, is quite possibly of placental genesis.

(2) That characteristic hepatic changes are not present in every case of the disease, and when occurring are probably secondary.

(3) That in rapidly fatal cases the kidneys, as eliminative organs, will probably be first affected by the poison and will show the chief changes in the epithelium of the distal portion of the proximal convoluted tubules, and.

(4) That alterations in thyroid gland function may be directly or indirectly responsible for the development of the toxemic state resulting in eclampsia.

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TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of May 8, 1906.

Papers on

CYSTOCELE AND ITS SURGICAL TREATMENT

were read by Doctors GOFFE,* DICKINSON, AND CHILD.†

PROF. DUHRSSSEN, the guest of the evening, said that he was very much interested in the papers of Doctors Goffe and Dickinson, especially the former, as he had followed the same operative measures in the treatment of prolapse since 1893. All these pictures were very well known to him, for he operates in exactly the same manner for uterine prolapse as does Goffe. He separated the bladder to such an extent that he could determine the lower part of the broad ligament and separate not only the anterior wall of the uterus from the ligament, but also from its own peritoneum. If this was done high enough so that one could extract the whole uterus below before the anterior vaginal wall was opened, one could see the whole uterus through the thin peritoneum. In cases of old women he opened the peritoneum, drew the uterus down and fixed it to the vaginal wall. Cases of subinvolution of the anterior wall he treated in the same way, and also complications due to the amputation of the cervix. If there was a tear in the perineum, he invariably did as Dr. Goffe does. He could say that all his cases, even the most contrary, were doing very well, some which were operated upon as far back as 1893 having had no recurrence; therefore, he could speak with assurance of the worth of these methods. He was sure, also, that sometimes it was possible to cure patients by Dr. Dickinson's method; but he believed in the vaginal route in most cases, especially in young women. He wrote a book on these methods of treating prolapse in 1898, and also published a little paper on the same subject since then. In Germany these measures went by another term, but he believed he was the first to operate upon and treat patients in this way for the cure of prolapse.

DR. H. C. COE said that while listening to the interesting and scientific presentations of the familiar theme, he could not help recalling the old operations of Sims and Emmet, which

*See original article, page 502.

†See original article, page 514.

all were taught to believe were sufficient to cure cystocele. They were based on the crude theory that the indications were met by simply removing the redundant tissue from the anterior vaginal wall, and the same operation was applied in the treatment of rectocele, until Emmet himself pointed out the now familiar fact that the true lesion in laceration of the pelvic floor is in the levator ani muscles and fascia, and not the perineal body or vaginal tissue.

While accepting the statements of the readers that cystocele could not be cured without replacing the bladder as far as possible in its normal position and endeavoring to retain it there, either by lifting the viscus alone or together with the uterus, it had been the speaker's experience, and probably that of other operators as well, that it was difficult to determine the exact level at which to suspend the prolapsed organ without giving rise to vesical irritation. It was an ordinary clinical fact that the base of the bladder being more or less a fixed point, as well as an exceedingly sensitive one, all dislocations of the uterus, whether upward or downward, caused traction at this point with resulting symptoms, which might be more constant and annoying than those due to the original cystocele. The proper point at which to suspend the precedent uterus in order to dispose of the vesical hernia without producing undue traction on the neck of the bladder, was not always easy to determine at the operating table.

DR. EGBERT H. GRANDIN thought that the matter would be much simplified if it were remembered that cystocele was simply a hernia of the bladder, and not a subinvolution of the anterior vaginal wall. There were two types of cystocele: the one where the bladder herniated without coincident sagging of the uterus, the other where there existed coincident ptosis of the uterus. In the first instance all that was necessary was the exposure of the bladder and the suturing of the muscles and the fascia. This was not a mere denudation of tissue, however. In the second instance he was skeptical as to the ability of any one to cure the case by means of any vaginal operation alone, such as that, at any rate, favored by the guest of the evening. In these instances it was necessary first to open the abdominal cavity and to suspend the uterus high up, in old women and in those past the child-bearing age to perform a supravaginal amputation and to stitch the stump of the cervix high upward, and then to place the woman in the lithotomy position and treat the cystocele as a hernia.

DR. H. N. VINEBERG said that the operation for cystocele in elderly women was best met by what is known as the Mackenrodt operation for retroflexion. The originator of the operation did not have quite the right view of the correcting of cystocele; but the speaker had found that it was the best operation in vogue for that condition. Mackenrodt was the first

to make the longitudinal incision in the first step of vaginal fixation. Prof. Dührssen employed the transverse incision, and it was only in latter years when he found that the transverse incision would not admit of the delivery of the uterus with the same ease as the longitudinal incision, that he also adopted the latter incision. In young women during the child-bearing period the speaker was in the habit of employing a modification of that method. He made the longitudinal incision, pushed back the bladder, but did not open the peritoneal cavity; then after excision of the excess of the vaginal flaps, he passed a deep layer of sutures, taking in the fascia and involved mucosa, and the last of these sutures was made to pass through the anterior wall of the uterus just above the internal os, then the vaginal flaps were brought together by uninterrupted chromicized catgut. In this way the bladder was well pushed up and held in position by the deep sutures. The old method of mere denudation of the vaginal mucosa and subsequent suture, to his mind, was sure to be attended by a speedy relapse of the cystocele. He could imagine some cases of such extreme hernia of all the pelvic contents which could not be remedied by the Mackenrodt operation, and in these instances he might be tempted to open the abdomen, do a high ventral fixation and a fixation of the bladder to the abdominal wall as suggested by Dr. Dickinson. Thus far, however, he could not recall many instances in which the Mackenrodt operation, that is, pushing the bladder beyond the fundus, suturing the entire vaginal wall to the anterior wall of the uterus, amputating the lower portion of the uterus, and doing an extensive posterior colporrhaphy, had not met with satisfactory results.

DR. J. MILTON MABBOTT said he would like to discuss the etiology of cystocele in regard to the two points referred to by Dr. Goffe, particularly in reference to their practical application. The first point was the laceration of the fascia, or attachments of the ligaments, when the anterior lip of the cervix is pushed down before the head in a case of labor. He felt under obligation to Dr. Goffe for calling attention to this important additional reason for replacing the cervix. The other point which Dr. Goffe merely mentioned was in reference to the involution of the ligaments which normally suspend the uterus. At the end of pregnancy these ligaments run obliquely upwards from their pelvic attachments to the uterus, which fact he had had an opportunity of verifying the day before, in a Cesarean operation, done by Dr. George Tucker Harrison. Some years ago he attended a patient in her fourth confinement, in which, he was practically certain, no new laceration occurred. The woman was in very poor circumstances, a charity patient, and she had employed a nurse, who, after having received a dollar a day for two days' attendance, went on a spree and never returned. When he visited the patient

on the third day he found her up and dressed, doing all the work for her family of four children. She apparently progressed perfectly well during the two or three weeks in which he continued his attendance; but several weeks later, on meeting the woman on the street and inquiring how she was getting along, she answered, "Oh, Doctor, my womb is completely outside of my body." This case demonstrated the importance of keeping a patient in bed for a sufficient number of days after delivery to insure involution of both the uterus and its supporting ligaments.

PROF. DÜHRSEN said, in reference to the remarks of Dr. Coe, that the cure of prolapse by vaginal fixation of the uterus was absolutely perfect, and that in the latter fixation particularly, the uterus was often in an absolutely normal position, so that no one would believe any such operation had been done, or such a prolapse of the uterus had ever existed. He had operated on a uterus in prolapse without opening the peritoneum in 1896 in a case where the above method of vaginal fixation was employed for retroflexion in connection with prolapse, and therefore he first did vaginal fixation in a case of prolapsed retroflexed uterus. In 1890 he fixed the uterus higher on the anterior peritoneum. He did this operation in cases of prolapsed bladder in connection with prolapse of the uterus, also in young women, and had never observed any difficulty in subsequent labors from retroversion if the opened peritoneum was closed in the ligation. He had followed this method almost altogether since 1895, and had observed 1,600 cases of vaginal fixation and subsequent delivery without trouble in almost every case.

DR. DICKINSON, in closing, regretted that he had failed to make clear that the radical operation of ventral fixation of the bladder was to be chosen only for patients presenting two definite conditions: first, very extensive protrusion of a large section of the bladder through the introitus; and second, cases with such atrophies or defects in the pelvic floor that no adequate supports could be built beneath the cystocele. He wished it clearly understood that the sliding of the bladder upon the uterus, or plastic work upon the two vaginal walls as advocated by the distinguished guest, completely met the indications in muscular young women with thick and ample structures at the pelvic outlet from which one could build supports, and in women with moderate prolapse who were not to be exposed to further risk of delivery. He would be glad to make further test of Prof. Dührssen's recommendations. As to Dr. Goffe's radical measures in completely sweeping off the bladder and uterus, right and left, clear to the anterior supports, he would positively affirm that ventral fixation was swift, simple, and harmless in comparison with such extensive denudation and stitching as Dr. Goffe advocated. Ventral fixation of the prolapsed

bladder was good mechanics and simple surgery. His last word was that ventral fixation of the prolapsed bladder had a field which no other operation could pretend to fill.

DR. VINEBERG said he would like to ask Dr. Dickinson if he had ever had occasion to open the abdomen and stitch the bladder up in cases of recurrent cystocele after hysterectomy had been done for complete prolapse.

DR. DICKINSON said that he had had two such cases and that he had met with very good results.

PRESENTATION OF SPECIMENS.

DR. H. J. BOLDT presented a specimen of

HYDROSALPINX.

The specimen is interesting because of its appearance and size. It is five inches long and two and three-fourths inches in diameter at its middle part and nearly that diameter at its terminal end. Towards its uterine end the tube is twisted like a corkscrew. The ovary was practically normal and it was therefore implanted into the uterine cornu. The other tube was in a condition of catarrhal salpingitis. It was not removed. The diagnosis was correctly made before operation. The patient, M. W., 31 years old, married five years, had never been pregnant. She had been complaining of pain in both iliac regions, principally in the right fossa, the seat of the hydrosalpinx. There was present also a chronic catarrhal appendicitis. The only larger specimen of hydrosalpinx that I have seen, I removed post mortem from one of my patients. It contained probably 500 c.c. of fluid. The drawing is given in a cut by Wylie, Fig. 311, page 923, in the "American System of Gynecology."

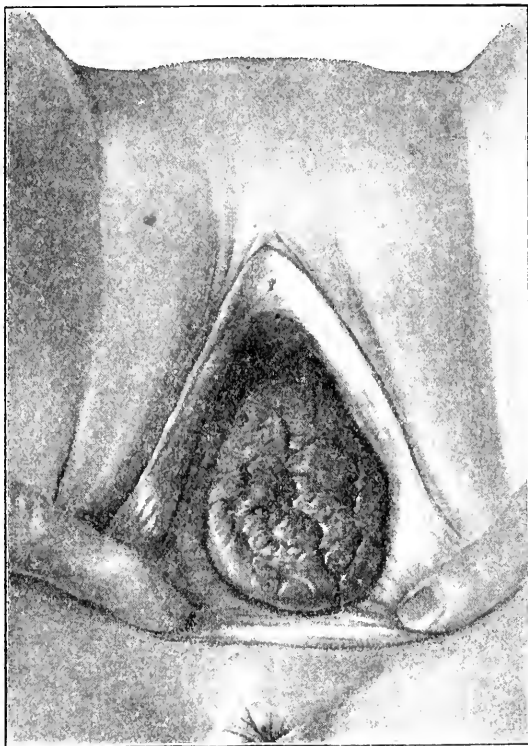
DR. BOLDT also presented a

PRIMARY MELANOTIC SARCOMA OF THE POSTERIOR VAGINAL WALL.

D. M., 37 years old; never pregnant. The woman was referred to me on October 24, 1905, by Dr. Otto Maier. She had complained only of profuse leucorrhea since August. On the posterior wall of the vagina there was an indurated sloughing tumor, elevated about half an inch above the surrounding vaginal mucous membrane. Its edges were sharply marked and it extended a little more on the left vaginal wall. The uterus was freely movable, and the tumor could also be readily moved upon the underlying perivaginal tissue. The clinical diagnosis of primary papillomatous carcinoma of the vagina was made. The excision was performed with a galvanocautery knife, going out some distance into apparently normal structure,

which was corroborated by the pathological report. The edges of the wound were brought together with catgut sutures. Primary union. Four weeks after operation there was no evidence of recurrence, but when examined again, two weeks later, the perivaginal tissue on the left side and the cellular tissue began to show evidence of deep infiltration.

Pathological Report.—The deeper parts of the tumor show numerous strands of small, round cells, with very distinct,



Sarcoma of posterior wall of vagina.

deeply-staining nucleus and very little protoplasm. These cell-masses fill up and dilate the lymph spaces, and surround the vessels, which are very numerous and filled with blood. In some places the cells have opened the vessels, probably by necrosing their walls, and have caused extensive hemorrhages into the surrounding tissues. In other places, necroses are pronounced. Reactive inflammation is very slight. The growth is decidedly infiltrating, the surrounding healthy tissue showing but little

change. Deeper in the center, the cells are laden with dark pigment. Diagnosis: Very malignant, small, round-celled, melanotic, hemangio-sarcoma, with extensive lymphatic involvement.

There was no evidence of glandular involvement during the time that the patient remained under my observation. Neither was malignant disease of any other part of the body observed. Whether the total extirpation of the uterus and the entire vagina would have given freedom of recurrence in this case is doubtful; nevertheless, that was the proper operation to perform, and it was omitted only because the disease seemed so circumscribed.

DR. BOLDT showed a

FIBROID TUMOR DEVELOPED IN THE MIDDLE PART OF THE ANTERIOR VAGINAL WALL.

The specimen is of interest because of the comparative rarity of location. It was removed from a woman 42 years old. There was no difficulty in enucleating it from its bed in the perivaginal tissue. The symptom caused by the neoplasm was constant desire to urinate. Five years previously she had been operated upon by me for ruptured tubal pregnancy. Pathological Report: Tumor is $1\frac{1}{2} \times 1 \times \frac{3}{4}$ inches; presents a firm, smooth, white surface and a very hard, firm, and white interior. The cut section shows a fibrous structure, the fibers running irregularly in all directions. Microscopically the tumor is a pure fibroma durum, without muscular elements and very poor in cells and blood-vessels. The fibers are arranged concentrically about the periphery and more irregularly in this center, where they form whorls running in all directions. The few vessels present show thickened walls and seem to be somewhat compressed by the fibrous tissue.

DR. BOLDT presented

AN UNUSUALLY LARGE HYDATID OF MORGAGNI.

So far as existing literature on hydatids of Morgagni is concerned, these cysts are considered of no practical importance. I have never seen them attain a size larger than about half an inch in diameter. A thorough search of the literature has given me a negative result in finding an instance in which such cysts have attained a size sufficient to give rise to pathological symptoms. The history of this case is: F. G., 43 years old, married 21 years, mother of five children, the last born five years ago. The menstrual history, except the presence of moderate dysmenorrhea, was negative. Her present illness was of two years duration. The complaint during that period had been pain in the left hip and left lower abdomen. The pain

in the left lower abdomen a few days before consulting me became much intensified. Examination was so painful to the patient that it could not be accurately made. It could be ascertained that there was a cystic tumor present in front of the somewhat enlarged uterus, which originated from the left adnexa; this was diagnosed to be a small ovarian cyst with a twisted pedicle. The base of the left broad ligament was thickened. On opening the abdomen the tumor was found to come from the terminal end of the left Fallopian tube, one of the fimbriæ forming its base. It had become so displaced as to cause a half twist of the tube. There was no connection with the ovary, and there were no adhesions. In consequence of the disturbance of circulation, the ovary had a highly congested appearance. The diameters of the tumor are $3 \times 3\frac{3}{4}$ inches. The treatment was, of course, very simple. A small ligature around the thin pedicle of the tumor sufficed, and before the abdomen was closed the correction of the circulation began to make itself manifest in the tube.

DR. R. W. WALDO presented several

FOREIGN BODIES LEFT IN THE ABDOMINAL CAVITY AFTER LAPAROTOMY.

The first gauze pad presented was removed March 13, 1906. The patient gave a history that she had been troubled with meno- and metrorrhagia for several years. Two years ago she had her uterine appendages removed in a New York hospital, to stop the bleeding, but without effect. Since then she had been under constant gynecological treatment without relief. On examination nothing was found to account for the bleeding, except that there was evidence of chronic pelvic inflammation. The uterus was intended to be extirpated per vaginam. This was found to be technically very difficult because of adhesions from pelvic inflammation. Coils of intestines were intimately adherent to the uterus. While examining the pelvis through the posterior section a mass was felt attached to the upper part of the rectum so intimately that it seemed risky to attempt its removal by the vaginal route, hence the abdomen was opened to complete the operation and to enucleate the mass felt to be adherent to the bowel. It was found, then, that the mass in question was an iodoform gauze pad which had become encysted and had practically remained innocuous for the past two years. There was but little pus in the cavity.

The second specimen is an operating room towel, which was used with other towels to wall off the general peritoneal cavity from contamination with pus during a complicated abdominal hysterectomy for a large fibromyoma and ovarian abscess. The operation was done last October. There was primary union of the wound, yet during convalescence the woman

complained of indefinite abdominal pains. Some days after her discharge from the hospital her doctor informed me that the lower part of the abdominal incision had broken down and given exit to a considerable quantity of pus. I saw the woman in her home, and while I could not account for the late breaking down of the wound it was evident that the patient was in no danger. Some days later the doctor informed me that while dressing the wound, he saw protruding at its edge, a foreign substance, which he pulled out and which proved to be the towel presented. Some years ago I wrote a paper on this subject, as to how to avoid the possibilities of such accidents. These rules have been strictly carried out; that is, every gauze pad, and every towel to be used in the abdomen is counted by a nurse who is held responsible for the count. In this instance the count came back as correct, that everything had been accounted for, consequently the abdomen was closed. The legal part of such misfortunes is interesting. Can the operator, when such precautions are taken, be held responsible? The woman made a satisfactory recovery after the removal of the foreign body.

DR. EGBERT H. GRANDIN.—In regard to foreign bodies left in the peritoneal cavity, I wish to impress upon those present that I think all that the law requires on the part of an operator is the exercise of due diligence and that therefore, other things equal, no suit against a surgeon should hold. I am cognizant of eight instances where under the best circumstances and amid the most careful surroundings, pads have been left in the cavity, although the count had been called for and had been made. All the cases recovered, however. In one instance the pad was found two and one-half years after operation, encysted in the omentum. In another instance a house surgeon, of stupid type, had inserted a towel, marked with the name of the hospital, and forgot to remind the operator. The count of the pads being correct, the abdomen was closed. Three weeks thereafter a tumor was discovered under the liver and exploration revealed the towel. Time will not permit me to do more than mention the fact that artery forceps and clamps and spectacles have been left by well-known and careful men. Such occurrences are certainly to be deplored, but should not be considered culpable.

DR. G. G. WARD.—I feel as Dr. Grandin does on the subject of foreign bodies, and approve of all that he has said. I have had some personal experience in this line. A few years ago I was called to operate in a case of intestinal obstruction. I found an artery clamp six inches in length, which had been left in the abdominal cavity four months before, the patient having been operated upon by a prominent member of the profession for a cyst in the abdominal cavity. When I saw this patient she was *in extremis*, and upon examination I found the

forceps the cause of the intestinal obstruction. All operators who do much abdominal work must expect this accident to possibly happen, even when the greatest care is taken. I have had but one unfortunate experience of this nature, and that was this fall, when I did a hysterectomy, and afterwards there was some sloughing in the vaginal vault, and a small gauze pad came away. I was at a loss at first to account for this, but remembered later that I had had some difficulty in ligating one of the uterine arteries and the house surgeon used a small gauze pad for the purpose of pressure. As it became obscured by a clot of blood it was left *in situ* by mistake and I carefully sutured the peritoneum over it so that it was left finally extra-peritoneal. I believe that the device which I first saw employed by Dr. Polk is a very valuable one to prevent accidents of this nature, and that is to use, instead of gauze sponges, one long roll of gauze five or six feet in length and four to five inches in width, folded in several thicknesses. This is rolled like a roller bandage, and is unrolled as needed in walling off the intestines. When sufficient has been unwound the remainder is clamped with forceps so that the roll can be taken up or let out as the case requires. In this way, as no other sponges are used in the abdominal cavity for walling off the intestines, it is impossible to leave anything behind, and this does away with counting and tapes. I have been using this method in all my cases with very great satisfaction.

DR. ABRAM BROTHERS.—My experience with foreign bodies, particularly pads, after operation, dates back more than ten or twelve years. The first case which I recall occurred after a vaginal hysterectomy done with clamps, in which a portion of gauze drain that my house surgeon should have removed was left in the lower portion of the peritoneal cavity. The patient, several months later, called at my office complaining of a profuse foul-smelling discharge. Upon examination the overlooked piece of gauze was found protruding from the vaginal fornix, and on its removal the patient naturally made a speedy recovery. The second case occurred about this same time, in another institution, in connection with a patient whose condition caused us the greatest anxiety and much excitement. She was brought to the hospital with a primary intraperitoneal hemorrhage, caused by rupture of ectopic gestation. We rapidly performed abdominal section, and the patient was sent to the ward. After recovery from the shock of the operation, several hours later, I was called to see the patient and found her suffering from symptoms of a second hemorrhage, due to the slipping of one of the ligatures. With anesthesia the wound was rapidly reopened and the bleeding point caught in clamps. Nothing then was done, as the patient was pulseless. She again temporarily improved and promptly, as soon as she emerged from her collapse, the drained abdominal wound indicated a low

grade of oozing from tissues beyond the immediate control of the clamps. For the third time, on this same day, the stump was inspected, and in spite of the patient's debilitated state, a suture was rapidly passed over the divided broad ligament. This controlled the bleeding. After intravenous infusion and other vigorous stimulation, the patient rallied, but convalescence was marred by a low-grade febrile movement, which was explained after four or six weeks by the protrusion of the end of a gauze pad, evidently overlooked during the excitement of the operative work. The third case, recently reported before the Obstetrical Section of the Academy of Medicine, I narrate because of its suggestiveness as to the possibility of a forgotten pad. This patient had been operated upon two years previously by me for tuberculous peritonitis, for which the cavity was drained. A ventral hernia occurred. Patient made a good recovery from the operation, and I lost sight of her for a period of two years. One evening, about a month or six weeks ago, she called at my office and presented a febrile condition, with frequent pulse and tenderness in the region of the hernia. I found a hard lump, which was dull to percussion, and while diagnosis of an inflamed incarcerated ventral hernia seemed probable, I could not entirely exclude the possibility of a gauze pad having been forgotten at the time of the former operation, particularly as there were symptoms indicative of intestinal obstruction. I ordered her to the hospital and operated upon her the following morning. After opening into the localized serous effusion, I found on one portion of the intestine, an insulated area, through which protruded one end of a fish bone. On its removal, suture of the ulcer, and surgical treatment directed towards the ventral hernia, the patient made a good recovery. I think it well for each of us to publish our experiences in regard to foreign bodies left in the peritoneum after abdominal work. The responsibility of the directing surgeon is great, but fair-minded people must allow that the surgeon's eyes and hands cannot be everywhere at one time, particularly in the face of grave, rapid work in the effort to save life. Hence assistants and nurses are assumed to relieve the surgeon and share in part the responsibilities. When, from time to time an error due to neglect, or oversight, is committed, by either assistant or nurse, the surgeon having made every provision that human foresight can provide, criticism of the operator should not be too harsh in the event of the occurrence of such an accident.

DR. H. C. COE.—I am very sensitive on the subject of foreign bodies, for I myself have been an offender, having, on two or three occasions, left gauze pads within the abdominal cavity, which were recovered later without serious injury to the patient. I am fully in accord with the sentiments expressed by Dr. Grandin that this accident, though far less likely than formerly, on ac-

count of the greater precaution observed by abdominal surgeons, may occur to the most careful operator. It is certainly our duty to support our confrères whenever they are placed in an unpleasant position before the public on account of this accident. The wide excursion which a foreign body may make when left within the abdominal cavity, is illustrated in the following case: A friend of mine had performed a vaginal hysterectomy with clamps, which were removed at the end of forty-eight hours, the patient having presented no unfavorable symptoms up to this time. On removing the clamps the surgeon found, to his dismay, that one of them was a sponge-holder, minus the sponge. He called me in consultation late at night, and after considerable discussion, pro and con, we concluded to open the abdominal cavity, and after a long search, the missing wipe was found under the liver, where it had traveled from the pelvis. Although this occurred in the preantiseptic days the patient fortunately recovered.

DR. J. R. GOFFE presented a specimen of

CHOLELITHIASIS.

The specimen I present is that of gall-bladder, with two large gallstones. These were removed from a patient four days ago. The patient was a woman 46 years of age, who had never had any distinct gallstone colic, but had suffered from indigestion, associated with severe headaches for over six years. My attention was attracted to her condition by the quality of the patient's breath. I was in attendance upon her sister, and meeting this woman daily I had opportunity of knowing that her breath was very offensive. I suggested to her husband that this was due to some serious difficulty along her digestive tract. He asked me to take her in hand, and upon thorough examination, having eliminated appendicitis, I discovered an enlarged gall-bladder, reaching to a point on a line with the umbilicus. At times I thought I could detect a gallstone. I advised operation, and last Friday morning, through a straight incision along the border of the rectus muscle, I delivered the fundus of the gall-bladder, incised it to discover the nature of its contents, and found one large stone near the fundus and the second embedded in the walls of the gall-bladder at the opening of the cystic duct and occluding it. The gall-bladder itself was distended with bile, mucus, and pus. The walls were thickened and congested. I therefore concluded to do a cholecystectomy. The bladder was separated from the liver and cystic duct and its artery with connected tissue was transfixed and ligated with catgut. The complete surface of the liver along the sulcus of the gall-bladder was then whipped together by continuous suture of catgut, and the abdominal cavity closed without drainage. The patient is making an uninterrupted recovery.

She has neither increase of temperature nor of pulse. A feature of no little interest in connection with the gallstone lies in the fact that the one that was embedded in the duct is oval at one end, but has a very smooth facet at the other. The loose stone, which was at the fundus, is barrel-shaped, having its two ends very highly polished. The only way that this could have been accomplished must have been by the stone being repeatedly reversed, one end impinging strongly upon the fixed stone and being polished by the friction due to the strong contractions of the bladder. Then the stone must have been reversed for a time and the other end put through the same process. The large stone is about $\frac{7}{8}$ of an inch long and 2 inches in circumference, the smaller $\frac{1}{2}$ inch long and $1\frac{1}{2}$ inches in circumference

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF LONDON.

Meeting of July 4, 1906.

The President, DR. DAKIN, in the Chair.

DR. LOUISE McILROY read a paper (followed by a demonstration) on

PRIMARY CANCER OF THE OVARY.

Conclusions from the Clinical Standpoint.—Primary cancer of the ovary occurs in women about the time of the menopause, or after, but is found in young patients; in the latter cases menstruation is influenced, cessation of the periods occurring. Previous child-bearing has no influence. Pain is not a marked symptom, patients seeking operation on account of the swelling of the abdomen. Ascites is present in most cases. Metastasis depends upon the duration of the disease and the integrity of the tumor capsule. The probability of recurrence is great. Malignancy is rarely suspected previous to the operation.

From Pathological Investigations.—Both ovaries are frequently affected, one showing a more advanced stage of the disease than the other. In early stage the capsule is firm, later on becomes broken down and tumor tissue proliferates through it. Germinal epithelium is absent as a rule. No Graafian follicles or corpora lutea found. Previous benign change in the ovary always present. The most common forms of cancer in the ovary are the glandular cystic form and the alveolar with connective tissue increase. The growth is found near the surface and in the folds in early specimens. The origin

of the growth is from the follicle cells, and from cells which have been derived from the germ epithelium. The so-called ova of the German pathologists are masses of degenerated protoplasm; they are retrogressive products of the follicle cells. Karyokinesis is not well marked in these cancer-cell tumors. The cells found in cancer of the ovary resemble those found in benign growths, but differ in their distribution, irregular arrangement, and in the amount of proliferation.

DR. EDEN said that on two points, at any rate, the author appeared to have made an important contribution to our knowledge. One point was that she had traced the invasion of the ovarian stroma by cells derived from malignant changes in the germ epithelium. The second was that she believed she had traced the transition stages by which the epithelial cells of a benign cyst became transformed into the malignant cells of an adenocarcinoma.

DR. RUSSELL ANDREWS congratulated Dr. McIlroy on the excellent demonstration that she had given, and asked her whether her researches had led her to agree with the teaching of some German writers that many adenomatous or pseudo-mucinous ovarian cysts which appeared to be perfectly innocent to the naked eye proved to be malignant on microscopical examination. If this teaching is accepted it becomes our duty to remove all adenomatous ovarian tumors whole, without diminishing their size by tapping, however large they may be.

DR. FAIRBAIRN said there was one point in the paper which he had not been able to follow and that was the statement that the carcinomatous tumors in all cases followed on a previously benign growth. The proof of this was far from complete, and as he understood was based on observation of histological changes in different parts of the tumor; in other words, on tracing the transition of a regular goblet-celled epithelium into an irregular epithelial growth of carcinomatous cells.

DR. WILLIAMSON said that from his own observations he could confirm two of the conclusions the author had arrived at. The first was with regard to the development of the cells of the membrana granulosa, and the second was the recognition of the part played by later downgrowths of the germinal epithelium in the genesis of ovarian tumors.

DR. MAY THORNE did not consider that pain was such a very rare symptom in the earliest stage of carcinoma of the ovary, and quoted a case of her own in which acute pain was the first thing which attracted attention.

DR. NEPEAN LONGRIDGE read a short communication on

SIXTY-FOUR CASES OF CONTRACTED PELVIS.

These cases were treated during 1905, at Queen Charlotte's Hospital. The system of admission is arranged so that it is possible to recognize and treat if necessary, the cases of con-

tracted pelvis at an early date. The results in these cases were satisfactory as regards the mothers, no death or serious complication being noted. Eight infants died, three of which were suffering from some abnormality incompatible with life. A special feature of this series is a group of 14 cases in which labor was unaided and spontaneous, the most remarkable case being a primipara who gave birth to a living child weighing 5 pounds, $12\frac{1}{4}$ ounces, through a true conjugate of 28 inches, in 10 hours. Nine of these cases were primiparæ and 5 multiparæ. Two infants were born dead, one being macerated and one hydrocephalic. Labor was induced by bougies in 17 multiparæ and 6 primiparæ. The date of induction was determined by estimating the relative size of the head and the pelvis. Delivery was unaided in 17 cases, 5 were delivered by forceps, and 1 by version. The mothers all made a good recovery and one infant was born dead. A second died on the third day, with an imperforate anus. The time which elapsed between the passage of the bougies and the birth of the child averaged 92.6 hours.

Eighteen cases were delivered by forceps, 5 after induction: the mothers and infants did well, with the exception of one case, in which the cord was prolapsed and the infant died. The occiput was posterior in 14 cases and was rotated forward by the hand in six. Version was performed in 6 cases in which contraction was present. Two infants died and the mothers did well.

Cesarean section was performed in 9 cases. The mothers all did well and one infant died. In one case the operation was performed for the second time.

The treatment of contracted pelvis appears to be narrowing down to two methods of election; namely, induction and Cesarean section, and the experience of Queen Charlotte's tends to show that the former is a satisfactory procedure with a conjugate of three and one-half and over, whereas Cesarean section is the best method to adopt in cases with conjugates of about three inches and under.

REVIEWS.

THE PRACTICE OF PEDIATRICS. In Original Contributions by American and English Authors. Edited by WALTER LESTER CARR, A.M., M.D., Consulting Physician to the French Hospital, New York, to the New York Eye and Ear Infirmary; Visiting Physician to the New York City Children's Hospitals, etc. Pp. 1,014. Illustrated with 199 engravings and 32 full-page plates. Lea Brothers & Co.: Philadelphia and New York, 1906.

The volume opens with a chapter by Edward P. Davis on the normal infant, the premature infant, the care of the latter and the diseases and injuries to which the new-born are subject. The interesting topics of development, growth, and hygiene are satisfactorily handled by Leroy M. Yale, and the chapters contain much sensible advice. As is usual in modern pediatric works, the problem of infant feeding is treated most fully. Thomas S. Southworth presents this important subject clearly and with an obvious mastery of its practical points. The recent discoveries regarding the chemical changes which occur in the casein of milk during gastric digestion are described and their logical bearing upon substitute feeding is emphasized. To the average student the subject of the theory and practice of percentage feeding always seems difficult, as so many authors describe a bewildering number of ways of calculating percentages. This the writer has avoided by the clear presentation of a single well-chosen method. Diseases of the alimentary tract are well described by David Bovaird, Jr., though this section naturally involves a certain amount of repetition of the subject-matter presented in the section on infant feeding, the chief disadvantage of works by many authors. The same is true of the section on diseases of nutrition by George M. Tuttle. The infectious diseases are described by I. A. Abt, David Bovaird, Jr., D. J. McCarthy, Matthias Nicoll, Jr., John Ruhräh, Floyd M. Crandall and George M. Tuttle. In this section, as in those on diseases of the mouth and pharynx and of the blood, the colored plates are most useful. Those contagious diseases to which children especially are subject are most fully discussed. The treatment advised is sound. One cannot, however, fail to be surprised that one writer, in speaking of the treatment of rheumatism, says that when salicyl derivatives act as irritants to the stomach they must be abandoned and alkalies given instead. No mention is made of the fact that in such cases the gastric disturbances may be avoided and the medication continued by the local application of methyl salicylate to the joints. Diseases of the respiratory tract are satisfactorily described by

Clive Riviere. In discussing the diseases of the heart and blood-vessels, F. J. Poynton divides the former into congenital heart disease, acute and chronic and malignant rheumatic heart disease, and heart disease resulting from diphtheria and from other infections. He avoids division of the subject into endocarditis, myocarditis and pericarditis, for, as he says, the rheumatic fever damages endocardium, myocardium and pericardium, and to this general injury is given the name carditis. Diseases of the genitourinary tract are described by Charles G. Jennings and those of the blood lymphatic system and ductless glands by John Ruhräh the latter prefacing the main portion of his subject by a brief description of the blood and its examination. Although the blood diseases are little understood the writer confines himself chiefly to a statement of the pathological findings and symptoms of each avoiding the discussion of theories. Diseases of the nervous system are well handled by D. J. McCarthy and are suitably illustrated. The volume closes with a brief chapter on the most common skin diseases of childhood by Charles T. Dade. The work as a whole is deserving of the highest commendation. For one of its class it is uncommonly free from repetition, historical digressions, and discussion of unproven theories. Throughout the volume the fact is never overlooked that its scope is to consider disease only as it affects children not from the standpoint of general medicine. Pathology is very briefly treated, symptomatology and treatment receiving the bulk of the writer's attention. The work is distinctly one for the practitioner, not for the student, and to all practitioners it is most warmly commended as a clear and practical exposition of modern pediatrics. H. D.

MEDICAL JURISPRUDENCE, FORENSIC MEDICINE AND TOXICOLOGY.

By R. A. WITTHAUS, A.M., M.D., Professor of Chemistry, Physics and Toxicology in Cornell University, and TRACY C. BECKER, A.B., LL.B., Counsellor-at-law, Professor of Criminal Law and Medical Jurisprudence in the University of Buffalo, with the collaboration of AUGUST BECKER, Esq., CHAS. A. BASTON, Esq., Hon. GOODWIN BROWN, W. N. BULLARD, M.D.; G. C. CAMERON, M.D.; J. CLIFTON EDGAR, M.D.; JAMES EWING, M.D.; E. D. FISHER, M.D.; J. C. JOHNSON, M.D.; D. S. LAMB, M.D.; H. P. LOOMIS, M.D.; W. B. OUTTEN, M.D.; ROSWELL PARK, M.D.; J. PARMENTER, M.D.; IRVING C. ROSSE, M.D.; E. V. STODDARD, M.D.; GEORGE WOOLSEY, M.D.; J. H. WOODWARD, M.D. Second Edition, Vol. I. Pp. 996. New York: William Wood and Company, 1906.

The advances of medicine and the enormous accumulation and complexity of laws in recent years have rendered the subject of medico-legal science a vastly different one from that which obtained as recently as a decade or two ago. Of the two elements, the medical and the legal, the latter has perhaps overshadowed the former in its influence on the modern aspects of the

subject. This is particularly evident in that branch of the science known as medical jurisprudence, of which this volume, the first of a series of four, mainly treats. The terms medical jurisprudence and forensic medicine are still used interchangeably to a greater or lesser degree, but strictly speaking the term medical jurisprudence should be limited to the science and usages of medical law. As such, the province of forensic medicine must be limited to the applicability of medical knowledge for the purposes of legal trials. With this distinction in mind we can better appreciate the contents of this volume. In former works on medical jurisprudence, nearly the entire contents were taken up with the criminal responsibility of the insane and the status of the medical expert. In recent years, however, an increasing number of other questions have arisen that have necessitated placing the entire subject on a much broader basis. For instance, the legal relations of the medical man to society, his right to practice, the question of his responsibility, his competency as a witness, the right to just compensation for services rendered, etc., etc. On the other hand, the growth of such recent cults as osteopathy, Christian Science, etc., has introduced a host of other legal problems, whose solution is still anything but complete. The extent of these latter problems can be appreciated when we find in the index sixty-three legal references to these cults alone. With all these subtle legal influences surrounding him, the medical man of the present has been brought more intimately in contact with legal affairs than ever before, and the subject of medical jurisprudence is one that he can no longer ignore.

After a short historical introduction, this volume opens with a chapter on "The Legal Relations of Physicians and Surgeons," by Tracy C. Becker. The chapter deals with the acquirement of the right to practice medicine, their legal duties and obligations, their right to compensation, their privileges and duties when summoned as witnesses, and their liability for malpractice. This chapter is followed by one on "The Law of Evidence Concerning Confidential Communications Between Physician and Patient," by Chas. A. Boston. This is succeeded by 600 pages of a complete synopsis of the laws of the United States, Canada and Great Britain, relating to the practice of medicine, by the same author. "The Legal Status of the Dead Body" and "The Powers and Duties of Coroners and medical Examiners" are then discussed by Tracy C. Becker and Augustus Becker respectively. The concluding five divisions are more medical in character. H. P. Loomis gives a very complete account of the proper method of conducting a medico-legal autopsy. The only criticism that may be noted in this chapter is the lack of any mention of the value and importance of the examination of the lymph nodes, superficial and deep. In the chapter on "Personal Identity," by Irving C. Rosse, the author discusses the legal importance, and the methods and signs for

its determination. In the succeeding chapter on "The Medico-legal Determination of the Time of Death," Loomis gives a very complete summary and criticism of the various tests for death, and the means whereby the time of death may be approximately determined. The volume concludes with two short chapters on "Death from Heat and Cold," and "Death from Starvation," by Enoch V. Stoddard. Reviews of publications in the medical press are conventionally so full of praise that it is difficult to accord the highest praise to any medical work. This tribute, however, we gladly pay to the volume before us, and if the term "standard" is taken in its fullest sense, we believe this series, if this volume is a type of what is to follow, will surely justify this expression. It is rare to find that sense of completeness and thoroughness in any book that this one affords. The value of the work is increased by an exceptionally full index, both to the cases cited and to the subject matter itself. There is also an extensive bibliography. It is difficult to see how this monumental work can be anything but indispensable, both to the lawyer and to the physician who is associated in any way with medico-legal work.

E. M.

MEDICAL AND SURGICAL REPORT OF THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK. Vol. VII, March, 1906.

Edited by JOHN S. THACHER, M.D., GEORGE WOOLSEY, M.D.

The current volume contains an appeal for funds to permit the open-air treatment of children on the roofs of the hospital, a critical analysis by C. A. McWilliams of 186 operations upon the liver and gall-passages, a discussion of extragenital infection of syphilis by A. F. Büchler, observations on diagnosis and treatment of typhoid perforation by George Woolsey, and a paper on suggested analgesia in surgery, by I. W. Kingsbury. The rest of the report deals chiefly with medical subjects.

DIE TECHNIK DER VAGINALEN BAUCHHOELEN-OPERATIONEN.

By E. WERTHEIM UND TH. MICHOLITSCH. With 138 illustrations. Leipzig: S. Hirzel, 1906.

This volume of 319 pages should be in the library of every physician interested in this department of surgery. The print is remarkably clear and on an unusually good quality of paper. The illustrations are the best that have ever been produced, so remarkably clear and instructive that they readily take the place of one seeing the work done directly by the operator. There is not a step in an operation that is not made clear by a most excellent illustration. The explanatory directions are concise and to the point. The book is in fact a work of art. There is, however, nothing in the text that is new, except, perhaps, the note, that although vaginal hysterectomy for cancer of the uterus is carefully described, it is not advocated by the authors because by the abdominal operation the disease can be better removed.

H. J. B.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

A Study of Macrosomia in Infants.—Achille Guglielimi (*Ann. di Ost. e Gin.*, May) has made a study of the records of the Maternity Hospital of Milan with reference to the frequency of overgrowth of the fetus during pregnancy. He found some 250 cases in all. He states that children weighing more than 4,000 grams are not rare, and such may be considered as of abnormal size. They lose weight during the first weeks of life, and their growth is established after an interval and slowly. The prognosis is better for the mother than for the child. As a rule the pelvis is roomy enough to permit of delivery, but the disproportion between the size of the head and the diameters of the pelvis leads to the necessity of interference in a considerable number of cases, and labor is apt to be slow owing to inertia, irregular pains and other causes connected with the size of the child. There are more males than females among these infants. The causes of overgrowth are various, depending on the conditions of health and life of the mother during pregnancy, the interval since the last pregnancy, the number of previous pregnancies, duration of pregnancy, and sex of the fetus. The placenta is larger than normal, as well as the child. Diagnosis of the excessive size may be made during pregnancy by history and examination of the patient.

Subcutaneous Symphyseotomy.—P. Zweifel (*Zent. f. Gyn.*, June 30) considers that a great step forward has been made in the adoption of subcutaneous methods of symphyseotomy and pubiotomy. The method is quite as applicable to symphyseotomy as to the sawing of the bone itself. The hematoma that may be produced after these operations the author believes not to come from the corpus cavernosum of the clitoris but from the internal pudendal artery, as he has observed personally. This artery is avoided if the passage for the chain saw is made subperiosteally. The cutting of the symphysis avoids all severe bleeding, since there are no arteries in the median line. A groove must be made on the posterior wall of the symphysis to prevent the saw from slipping aside. The sawing of the soft symphysis is done more rapidly than that of the hard bone of the ramus. The bladder may be avoided by making a small opening into the fascia of the linea alba and passing one finger down so as to push aside the bladder. A female catheter should be fastened into the urethra before the needle is introduced. The author has performed subcutaneous symphyseotomy three times with success. The symphysis heals quite as easily as the

bone, since it is not a true joint, having no synovial fluid and no synovial membrane. It is an error to say that as much danger attaches to it as to the opening of any other joint. The scar that is formed is a yielding one, so that later labors can go on successfully without operation.

Enlargement of the Pelvic Basin.—V. Bué (*Le Nord Med.*, May 1) discusses the relative value of symphyseotomy and pubiotomy for increasing the pelvic diameters in labor. The advantages of Gigli's operation are anatomical. There are no important structures in front of the pubic rami, only the ends of the tendons of the abdominal muscles and the pectineus. All are so attached that the section does not interfere with their integrity. On the posterior surface are only the ligamentous fibers that support the bladder, and the vesical plexus. The further one gets from the median line the less danger there is. The lower border has the corpus cavernosum of the clitoris and its veins, which may cause considerable hemorrhage that is easily controlled by pressure. The operation is very simple. With Doderlein's modification by which it becomes almost subcutaneous the danger of infection is very slight. Similar hemorrhages may occur in symphyseotomy as well as lacerations of the vaginal walls, but they rarely give trouble. Infection is the bane of symphyseotomy and the opening of a joint adds to its seriousness. Bladder troubles also occur after symphyseotomy which are absent after pubiotomy. Inability to walk is exceedingly rare. In pubiotomy the callus forms very rapidly and walking is perfect even with fibrous union. Practised under the best conditions the author believes that symphyseotomy is no more dangerous than pubiotomy. Both processes increase all the diameters. No more than one centimeter of increase is to be expected in the promonto-pubic diameter. Neither process is applicable to a pelvis with a promonto-pubic diameter of less than seven centimeters. In asymmetrical pelvises the lateral section is to be preferred. Gigli's operation is less dangerous in multiparæ and in flat pelvises: in the primipara or the woman with a generally contracted pelvis there is always danger of tearing the soft parts. Some operators consider pubiotomy an easier and quicker operation, since there is no middle line of cartilage to be sought, and no false route that the instrument can take, and the chain saw acts rapidly. The author has done symphyseotomy with the chain saw and finds it as rapid as pubiotomy. Its use simplifies the technique of symphyseotomy wonderfully. The solid advantages of pubiotomy are less hemorrhage, less tearing of soft parts and less danger of urinary complications.

The Inefficacy of Instrumental Curettage After Abortion.—G. Lepage (*Ann. de Gyn. et d'Obstet.*, June) reports a number of observations recorded in literature, as well as some cases seen by himself which show that instrumental curettage does not give

complete security of the emptying of the uterus after abortion, even when the curette is handled by an efficient operator. In some cases the operator will be deceived and portions or the whole of the placenta will be left behind to produce septic conditions. The author does not in his personal practice discard the use of the curette, which is most useful during the first two months of pregnancy, when the uterine cavity is so small as not to admit the finger easily. He believes that digital curettage alone permits us to be absolutely certain that all the placenta is gone. In using the curette one finger may be introduced with it, or the finger may be introduced afterward to ascertain whether the uterine cavity is entirely clear. He believes that we may wait for twenty-four to thirty-six hours after retention has occurred, in case there are no fever and no odor, but that at the end of that time one should dilate the cervix and remove the retained placenta as soon as possible, before any septic condition supervenes.

Vesical Examination by the Direct Cystoscope in Pregnancy.—

Paul Bar and Georges Luys (*Bull. de la Soc. d'Obst. de Paris*, March 15) draw attention to the value of intravesical separation of the urine of the two ureters as a means of diagnosis of pyelitic kidney conditions. During the last part of pregnancy, beginning at from the fifth to the seventh month, such separation becomes very difficult because of the deformation and change of position of the bladder due to the rise of the uterus. The difficulty is much greater in primiparæ and when the head is deep down in the pelvis. Cystoscopy should not be neglected in these cases, and it may easily be made by the use of the cystoscope that allows of direct vision. It allows of a view of all parts of the bladder and lesions may be seen with great precision and their exact position observed. The orifice of each ureter may be seen so that a ureteral catheter may be introduced. At the end of pregnancy the bladder may, as a result of over-distention and engagement of the fetal parts, be pushed up and form two pouches full of urine on either side of the uterus above the pubes. The trigonum may be found at one side or other of the median line. The lateral pouches of the bladder are emptied with difficulty and may give rise to vesical infection.

Chorea Gravidarum.—Herbert French and H. T. Hicks (*Practitioner*, Aug.), in a series of twenty-nine cases of chorea gravidarum, observed that rheumatism or chorea occurred previously in nineteen cases. They are convinced that chorea gravidarum and infantile chorea have the same pathology. The ages of these patients ran from 19 to 31, the majority were about 20, eighteen were primiparæ, five were in their second pregnancy, four in their third, and one each in the fourth and fifth. The tendency to recurrence was distinctly shown in four cases. Chorea may be absent during the first pregnancy yet occur in a later one; it may come on at any time, but is distinctly less

likely to occur during the later months. When chorea recurs in successive pregnancies it is prone to begin on the same month each time. The mortality in this series was 10 per cent. The writers draw attention to the significance of pyrexia in the prognosis. A rise of temperature above 100° F. would justify a grave prognosis. On the other hand, a normal temperature would justify a good prognosis, as far as immediate results were concerned, regardless of the severity of the choreic movements. The majority of cases do well when treated in exactly the same way as nonpregnant cases. The induction of labor is seldom the line of treatment to be adopted. It is unwise to induce labor simply because the movements are severe and after pyrexia has set in it is too late.

Oophorectomy During Pregnancy.—Abram Brothers (*Med. Rec.*, Aug. 18) reports operating on a patient seven weeks pregnant for the removal of an intraligamentary cyst and bilateral oophorectomy. In operating he used the transverse incision, as he believed this incision guards against hernia in progressive pregnancy. The patient went to term and was delivered of a living child.

Mental Disorders of Pregnancy and the Puerperal Period.—Nathan Raw (*Edin. Med. Jour.*, Aug.) bases a paper on the records of 102 cases of puerperal insanity. Sixty-eight of these were transferred to asylums according to the law at the end of three weeks; twenty-four were cured; eight died, and two are under treatment. In over sixty-two per cent. albuminuria was present; in several cases the albumin disappeared in a few days; in others it persisted for many weeks. In this series there were seventy-one cases of mania and thirty-one of melancholia. The cases of mania showed a tendency to recover more rapidly than those of melancholia. Only six of these cases were pregnant. The insanity of pregnancy generally develops between the third and seventh months and the symptoms are generally those of moral perversion, with melancholia and delusions of fear, suspicion and persecution. Insomnia is a persistent and troublesome symptom, and destructive tendencies are common. The treatment of this condition is largely expectant. In those cases where there is an hereditary tendency to insanity the prognosis is grave. In the six cases referred to above four recovered before delivery and two after. The treatment of this class of cases is that of ordinary mania or melancholia; the prognosis in most cases is favorable.

Post-partum Hemorrhage.—E. Stanmore Bishop (*Practitioner*, Aug.) believes the only rational way to stop post-partum hemorrhage is by compression of the abdominal aorta, combined with elevation of the pelvis. The aorta is best controlled by the ulnar surface of the operator's hand, while the other hand is used to note where the uterus tends to contract and to aid its contractions. The great majority of cases are out of danger within

one hour, but it may be necessary to keep up the compression much longer. The compressing force should be gradually and tentatively removed and the effect carefully watched, and compression renewed at once if the bleeding recurs. The elevation of the pelvis should be persisted in for at least twelve hours: longer if the amount lost has been great. It should also only very gradually be restored to the normal level.

GYNECOLOGY AND ABDOMINAL SURGERY.

Technique of Radical Operation for Large Umbilical Hernia.—

E. Graser (*Zent. f. Gyn.*, June 23) says that recurrences are frequent after operation for large umbilical herniæ. The results after laparotomy in the hospital at Erlangen have been most satisfactory. The author has made use of Pfannenstiel's method of suture with success in cases of large umbilical hernia. He modifies this method by splitting the rectus muscle into two layers before making his incision and incising the deep layer only when necessary. The disadvantages of the operation are these: the length of the operation, which is at least three hours; the enormous size of the wound; and the number of buried sutures that must be used, necessitating perfect asepsis in a very fat abdominal wall. The results are good enough to justify its use nevertheless. The skin incision is made horizontally across the abdomen on the most prominent part of the tumor, the length being thirty-five to fifty centimeters. The hernial sac is then opened, adhesions are freed, and the thinned part of the sac is cut away. The rectus is now separated into two layers, and the anterior layer is retracted before any incision into the muscular tissue is made. Above and below where the recti come near together the separation has to be aided by the scissors, cutting the posterior layer. The nutrition of the layers remains excellent. The abdominal wall is now sewed to the posterior layer of the rectus vertically and the two recti are sutured together in the median line. Then the fascia is sewed together carefully and the fat is united in the same manner. All hemorrhage is stopped and a glass drain is left in the lower part of the wound. A previous treatment of four weeks is valuable, consisting of purgation and compression of the hernia after reposition. After the bowels have moved for the first time all danger is over and an uninterrupted convalescence is usual.

Surgical Treatment of Gonorrhea in Women.—J. Wesley Bovée (*Amer. Jour. Surg.*, Aug.) advises against operation in acute gonorrheal tubal involvement. In chronic pyosalpinx, ablation of the tubes is best. The vaginal route is preferable in most cases. The ovaries are not to be sacrificed unless they are hopelessly involved or the patient is over forty. Both tubes should always be removed. The body of the uterus may be retained if not adherent or considerably involved. Cul-de-sac drainage is advisable in both vaginal and abdominal ablations.

Menstrual Fever and Menstrual Sepsis.—Riebold (*Deutsche med. Woch.*, July) has made a study of 2,000 patients observed within the last two years as to the temperature at the menstrual period. He concludes that in many cases there is a rise of temperature during menstruation that cannot be accounted for as from any other cause. The fever occurs generally on the third or fourth day, though it may come earlier or even after the flow has ceased. The fever and the leukocytosis attending menstruation are due to the absorption by the uterus of toxic or infective materials. During the menstrual period, the contained blood and mucus in the uterine cavity forms a very good culture medium, and at this time the normal protective power of the vaginal mucus is absent. The author believes that the menstrual period is of great importance in the pathogenesis of febrile disorders. A toxin similar to that producing the fever may cause many skin and nervous affections which occur during menstruation, such as erythema, urticaria, herpes zoster and neuralgias. They may also cause rheumatism in the form of true polyarthritis and heart rheumatism due to infection arising in the genital tract.

Cancer in the Cervical Stump.—Andrew F. Currier (*N. Y. Med. Jour.*, July 28) believes that after hysterectomy the patient should be examined at periods of six months to ascertain if the cervix is involved by cancer. This is especially desirable for those whose tissues are in a bad condition of nutrition or who suffer from hereditary taint. Complete removal of the uterus offers greater security from cancer than does retention of the cervix.

Observations on Fibroma Uteri Derived from Operations on 633 Cases.—C. Jacobs (*Bull. de la Soc. Belge de Gyn.*, Vol. XVI, No. 4) has operated on 633 cases of fibroma uteri. He concludes that it is a mistake to leave these growths in the abdomen under the impression that the menopause will bring about a regression of the growth which will benefit the patient. Whenever their presence produces symptoms, general or local, that are of a serious nature they should be removed. Such patients should always be kept under observation, since serious manifestations may take place at any time. Serious accidents arise from small tumors as well as large ones. Cure is the rule after well-conducted operations on fibroids. Out of 633 patients operated on by the author 609 were cured; 24 died. The author always leaves a portion of the cervix in place when it is not involved in the tumor. In 466 cases the operation was subtotal hysterectomy; in 89 cases it was total. When the cervix is involved in a metritis and endometritis with ectropion and ulcerations it should not be left. The cervix, when left in place, serves as a barrier to infection, assisted by antiseptic packing of the vagina. There are many types of degeneration to which fibromata are subject. Calcification is most common, and with it may be combined

necrosis of a part of the tumor. Fatty degeneration is relatively rare. Colloid degeneration is frequent. There were three cases of suppuration and septic mortification of fibromata. Sarcomatous degeneration is rare. Cancerous degeneration also is rare, as is adenomatous. Affections of the adnexa have no direct relation to the accompanying fibromata.

Mortality of Operations on Gall-Bladder and Bile Passages.—Wm. J. Mayo (*Ann. of Surg.*, Aug.) reports 1,500 operations upon the gall-bladder and bile passages performed by Charles H. Mayo and himself. Of these cases, sixty-six died, 4.43 per cent. In the first 1,000 cases the death rate was 5 per cent., in the last 500, 3.2 per cent. These statistics include every case dying in the hospital without regard to the length of time, and include death from accidental causes as pulmonary embolism, myocarditis and a number of chronic conditions. There were 845 cholecystostomies, with a mortality of 2.13 per cent. In only one of the 1,500 cases did gallstones reform. In connection with the common-duct surgery it is not wise to remove a functioning gall-bladder unless for direct indication; a common-duct case often requires a second operation; the gall-bladder not only affords easy drainage and enables cholecystenterostomy but serves as a guide for future operations. The operators performed 319 cholecystectomies with a mortality of 3.13 per cent. Out of 207 operations on the common-duct there were 105 cases with three deaths where stones were present in the duct, but without immediate active symptoms. In sixty-one cases with ten deaths, where there was an active infection of the common-duct and ducts of the liver. Stones were usually present. There were twenty-nine cases of complete obstruction with ten deaths and twelve cases with four deaths in which there was malignant disease.

Vermiform Appendix.—Arnold W. W. Lea (*Jour. Obst. and Gyn.*, Aug.) in view of the importance of the appendix as a cause of pelvic pain and inflammation and as a secondary complication of pelvic disease, advises the following procedure. The appendix should be examined as a routine precaution in all cases of abdominal section for pelvic disease. It should be removed (a) if it lies at the brim of the pelvis or in the pelvis; (b) if it shows any periappendical adhesions or contains a concretion; (c) if it is adherent to any pelvic inflammatory swelling or tumor; (d) if it lies in close relation to the pedicle or raw surface left after the removal of any pelvic organ.

DISEASES OF CHILDREN.

Cold Baths for Fever in Young Children.—Charles O'Donovan (*N. Y. Med. Jour.*, July 28) says that in convulsions of young children the rectal temperature should always be taken, as surprisingly high temperatures may often be found to exist, and it

would be manifestly improper to use for such a condition the too usual method of parboiling for convulsions. The proper treatment should be a cold, rather than hot bath, to reduce the fever and calm the overexcited nervous system of the child.

While he contends strongly for the use of cold baths even in young babies, he does not fail to understand that the method is capable of doing harm in improper cases. Not every child is able to stand the severe shock of a cold bath, so the physician should give the first bath, or stand by while it is being given, to note its effect on the child. Terror and fright, even manifest physical suffering from the cold, are not bars to its usefulness. A crying, screaming, struggling child is better than one sunk into the lethargy of coma, or working in convulsions. Cyanosis and failure to respond to the shock by crying and struggling are signs to be looked for and feared. Under these circumstances the bath must be stopped, the child wrapped in blankets, and stimulated with whiskey or digitalis. The length of time to keep a child in the bath is to be judged by its effect upon the patient and the result aimed at. A short dip will probably suffice for a stimulating shock; three or four minutes may be required to check a high and rising fever. Always study the condition of the patient during and after the bath. Older children, say, of six or eight years, stand severe tubbing remarkably well. They fight against the cold vigorously, but react rather promptly, and are much benefited. This applies to children of normal strength.

Hot Baths in Acute Bronchopulmonary Diseases of Infants.—Gaetano Finzio (*Ann. di Elett. Med. e. Ter. Fis.*, March, 1906) gives his results in the treatment of bronchopulmonary diseases in the acute stage in infants under one year. He has treated thirty-two such cases with the best results. The baths are used at a temperature a few degrees lower than that of the child, that is from 37° to 39° C. The child receives a stimulant before the bath, if it seems depressed, and mustard is added to the water. The author has noted the following effects from the baths, which he believes to be the causes of the good effects on the child. The bath aids in eliminating the poisons of the infection through the sweating produced. The inspiration is amplified and hot vapor is inspired while in the bath, which liquifies the mucous lining of the bronchial tubes, and favors expectoration. The surface of the skin is very much reddened by the bath, and this aids in drawing the congestion from the lungs themselves. The child perspires profusely at the same time. As soon as the child is taken from the bath he is wrapped in flannel and allowed to rest for some time. One advantage of the hot bath over the cold one is that the parents will be much more likely to permit its use than that of a cold one.

Chronic Appendicitis and Early Diagnosis and Treatment of Acute Appendicitis.—Auguste Broca (*Brit. Jour. of Child. Dis.*,

June, *Lancet*, June 9) says that appendicitis is now usually regarded as the localization of an enterocolitis formerly more extended. He calls particular attention to mucomembranous enteritis as one of the predisposing causes, because some have considered that there is a certain antagonism between that affection and appendicitis. He has seen children die and others almost die from repeated and unrecognized attacks of appendicitis, because of the evident association of mucomembranous enteritis with that disease. Appendicitis must be regarded as a chronic alteration aggravated by acute episodes. The writer describes several types of the disease. Some patients have gastrointestinal atony, frequently attended with flatulent abdominal distention, dyspepsia, eructations, obstinate constipation sometimes alternating with diarrhea, capricious appetite, and habitual nausea. They often have stomach ache without known cause and variable in frequency, intensity, and duration. There is sudden, sharp, and not well-localized abdominal pain, with sudden pallor and even a fainting sensation. In these cases there is usually a feeling of weight, an indefinite pain, or at least some degree of uneasiness in the right iliac fossa, and there may be felt a slightly thickened cecum expanded with gases, sometimes an enlarged appendix or lymph nodes. There is usually slight tenderness on deep palpation over McBurney's point, with slight muscular rigidity. Other cases show special and paroxysmal phenomena, especially vomiting, often in the morning only, which may become habitual. There may be obstinate constipation, headache, and retraction of the abdominal wall or meteorism. In these cases the symptoms of dyspepsia with gastrointestinal flatulence are exaggerated continually or by sudden attacks. In another class of cases the infectious element is more marked. Sometimes after too large a meal or without obvious cause there is an attack of indigestion with vomiting and temperature up to 39° to 40° C. (102° to 104° F.) and pain near the navel or in the right iliac fossa, where there is slight muscular resistance to palpation. Beware of those frequent indigestions which mothers treat with an emetic or other domestic medicine, when to the vomitings are joined a sudden fever and colic principally on the right side. Spontaneous pain or that excited by pressure in the right iliac fossa is also important. The rule of French surgeons is to operate immediately if called within the first twenty-four hours after the onset of the first attack; but if called later, to act according to the indications in the individual case, with the idea of calming the attack as much as possible before operating. Conditions in children which must be differentiated are pneumococcic and gonococcic peritonitis, intestinal helminthiasis, pneumonia with abdominal pain, and typhoid. Encysted peritonitis must be operated upon immediately only if an abscess has formed. In doubtful cases medical treatment is indicated: complete deprivation of food,

only a few spoonfuls of pure water, ice-bags on the abdomen, careful watching, opium only when specially required for painful colic not explained by an increase of the iliac swelling, and no purgatives. Operation should follow the slightest appearance of peritonitis, failure of temperature to yield, and increase of the local swelling. If vesical pain in passing urine or rectal examination shows pelvic localization of the swelling, there should be less delay. The common cases are the peritoneal ones. If the attack has been slight it is well to remove the appendix about a month after it subsides. Diffuse peritonitis requires a long incision in the right iliac fossa, through which one must try to remove the appendix. Almost always one must add to that first incision a median one, and often a third one in the left iliac fossa. The drainage must be very free, with very large india-rubber tubes going in different directions in the abdomen and the pelvis. Sometimes he washes out the abdomen with boiled water or physiological salt solution, but he does not employ this method regularly because not convinced that it improves the always unfavorable prognosis of the operation. Encysted suppurating peritonitis is treated as a simple abscess, by a large opening. The incision is to be made where the abscess is situated, on the right side or on the left, in front or behind. There is a divergence of opinion as to the treatment of pelvic abscesses. Some authors teach that the best plan is to open them by rectal incision. It cannot be denied that these abscesses after abdominal incision progress often worse than others. On the other hand, they sometimes heal spontaneously by discharging through the rectum. In spite of some successes due to that proceeding, it ought not to become general. It is dangerous for the high-situated abscess, which one must search for blindly, with special trocars, and the lower abscesses, which can be felt by the finger near the anus, almost always can be drained through the iliac fossa—sometimes through the left one—where there are swelling and adhesions. It is very rare to find that the appendix goes directly downwards and that an abscess has collected in the pelvis whilst the iliac fossa is entirely free. But when it happens so, the rectal incision may be of real help. After spontaneous or surgical opening into the rectum, the appendix is not treated and frequently gives no more trouble. In cases with localized abscesses the writer removes the appendix only when it can easily be seen under the adhesions. He ties the appendix and cuts it with the thermocautery. In the delayed operation the absolute indication is to remove the appendix. The writer has finally adopted the intermuscular operation, and if he meets with lesions calling for drainage, cuts the abdominal muscles upwards or downwards.

Pneumococcic Peritonitis in Children.—W. F. Annand and W. H. Bowen (*Lancet*, June 9) report sixteen cases of this affection from the records of the East London Hospital for Children

and a study of ninety-one collected cases. They say that pneumococcic peritonitis is a comparatively rare disease in children, but in the past many cases have not been recognized. It is in about a third of the cases secondary to some remote pneumococcal lesion; of these affections of the lungs and pleuræ are by far the commonest, the middle ear being the next most common site. The infection is carried to the peritoneum in the blood stream. In the remaining two-thirds the peritoneum is probably infected from the bowel in the vast majority. No microscopic lesion is, as a rule, found. In half the cases the pus is encysted; in these the diagnosis is fairly easy, the prognosis is good, and the treatment is laparotomy and drainage. In the other half of the cases the peritonitis is diffuse, the diagnosis is very difficult, and the prognosis very gloomy. The treatment is laparotomy. The pathological appearances are characteristic.

Ocular Eczema in Children.—Frederick Krauss (*N. Y. Med. Jour.*, June 30) says that certain phlyctenular inflammations of the conjunctiva and of the cornea in children, in connection with the nearly invariable presence of eczema, forcibly suggest an identity with eczema. There is an acute, sub-acute or chronic catarrhal inflammatory disease of the skin on or about the eyelids, of the conjunctiva, and often of the cornea, characterized by erythema, papules, vesicles or pustules or a combination of these, with a variable amount of infiltration, terminating in desquamation. Ocular eczema is a disease common in childhood, forming twenty-one per cent. of all eye diseases in children under sixteen years. It is most common at the age of two years, becoming less frequent as the age advances. It is endemic, but especially prevalent during the months of May, June and April, in the order named. Treatment is very important in modifying its progress and tendency to relapse, and should comprise general treatment with attention to diet and hygiene, as well as local treatment for the eye; the severer and stubborn cases quickly improve when rest in bed is required of the patient.

Salicylate Poisoning in Children.—Frederick Langmead (*Lancet*, June 30) records eight cases of poisoning by salicylate of soda in children from the records of the Hospital for Sick Children. The drug used at this hospital was found to be chemically pure. He says that salicylate of sodium sometimes causes in children symptoms resembling the acid poisoning of diabetes. The toxic dose is variable, depending on the idiosyncrasy of the patient and the presence or absence of constipation. Acetone may be detected in the urine and in the breath, its presence constituting one of the first symptoms of the poisoning, and affording a valuable danger signal. Treatment should be directed to keeping the acidity of the urine low and the bowels opened in cases of patients taking this drug. If acetone is found or the urine gets more and more strongly acid the salicylate should be omitted and alkali given alone.

Acute Leukemia in Infants.—Mamerto Acuna (*Arch. de Mal des Enf.*, June, 1906) says that acute leukemia is rare in infancy and childhood, although it may appear in the first months of life. Children are five or six times more rarely attacked than adults. Frequency increases as puberty is approached. The symptomatology is often defective and the diagnosis difficult, and to be made only by habitual blood examination, and the study of the hemoleukocyte formula. Its progress is very rapid in the child. There is a hyperacute form lasting not more than fifteen days, an acute form lasting eight weeks, and a sub-acute form lasting five or six months. The principal characteristics are swelling of the gland and spleen, hemorrhagic diathesis, acute fever, sudden onset, profound intoxication, and short duration. The author describes two cases, one of a leukemic lymphocytomia with rapid and intense course, in which the white blood corpuscles increased in number with the progress of the disease, while the glands, liver and spleen were only slightly swollen. This he calls a hyperacute leukemia approaching the hemorrhagic type. The second was a leukemic lymphocytomia from the beginning, with general lymphoid hyperplasia. There are forms intermediate between these two. Acute myelocytomia is also found in infants, although it is rare. Aside from gangrenous swelling of the mouth and blood examination we have no means of diagnosis early in the disease. Toward the end there are pains, progressive anemia, enlargement of the spleen, etc. In such cases the disease follows the course of an acute infection of the etiology of which we are ignorant, and which ends fatally.

ERROR.

The abstract of Dr. Billings' paper on Cerebro-spinal Meningitis on page 426 of this Journal, for September, should have been credited to the *Journal of the Am. Med. Assoc.* for June 2d, and not to the *New York Medical Journal*.

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ORIGINAL COMMUNICATIONS.

THE DIAGNOSIS AND SURGICAL TREATMENT OF
INJURIES TO THE DIAPHRAGM.¹

BY

JOHN YOUNG BROWN, M. D.,

St. Louis, Mo.

(With plate.)

IN electing me to the presidency of the American Association of Obstetricians and Gynecologists, you have conferred upon me a distinguished honor, for which I feel profoundly grateful.

I have chosen for the subject of this address, "The Diagnosis and Surgical Treatment of Injuries to the Diaphragm." In discussing this question, I wish to confine myself to a consideration of those cases in which the damage to this muscle is the direct result of trauma. Such injuries are far more frequent than is generally supposed, and they give a mortality which proves conclusively, that their early recognition and prompt surgical treatment has not received the attention from the profession that its importance demands.

The German, English, and American textbooks all advise that, unless there are special indications present, and those

¹The President's address before the nineteenth annual meeting of the American Association of Obstetricians and Gynecologists, held at Cincinnati, September 20 22, 1906.

indications are given as active hemorrhage from the internal mammary or intercostal arteries, penetrating wounds of the chest should be left alone. In wounds of this character, involving the upper thorax, such advice is sound; but in wounds below the seventh rib, the possibility of injury to the diaphragm, with associated damage to the abdominal viscera, should always be carefully considered.

Concerning the diagnosis and treatment of these injuries, our textbooks teach little, and with the exception of a few cases scattered through the literature, most of our knowledge of such wounds has been obtained at the autopsy table. Liechtenstern collected two hundred and fifty cases of traumatic diaphragmatic hernia. In only five of these was the diagnosis made before death, and as diaphragmatic hernia, unassociated with injury to the abdominal viscera, is a most favorable condition for surgical interference, it is reasonable to assume that many of these cases could have been saved had early operation been undertaken.

A number of cases have been recorded where, at autopsy, the stomach, with a part of the large and small bowel, has been found in the pleural cavity uninjured, the patients dying as the result of acute strangulation. The surgical treatment of such cases should give a comparatively low mortality.

Enumerated in the order of their frequency, injury to the diaphragm is generally the result of (1) penetrating stab wounds, (2) penetrating gunshot wounds, and (3) severe abdominal contusions.

In two hundred and sixteen cases of penetrating gunshot and stab wounds of the chest coming under the personal care of the writer and his assistant, Dr. Walter Kirchner, we have operated for injury to the diaphragm, associated with damage to the abdominal viscera, eight times. Five of these cases were the result of penetrating stab wounds of the chest and abdomen, two of penetrating gunshot wounds of the chest and abdomen, and one due to severe abdominal contusions. Of the eight cases, four died and four recovered.

In two of the fatal cases (one a stab wound, penetrating chest, diaphragm and stomach; and one, a gunshot wound of chest, perforating diaphragm and stomach), the diagnosis was not made until widespread peritonitis had developed. One (a stab wound of chest, diaphragm and stomach) died on the second

day. Autopsy showed no peritonitis, stomach wound completely sealed, considerable inflammatory changes in pleural cavity. In one (a stab wound of chest and diaphragm, complicated by an old diaphragmatic hernia), death was due to shock a few hours after patient left the operating table.

In the four cases that recovered, the following conditions were found at operation:

CASE I.—Penetrating stab wound of left chest and diaphragm, small wound of spleen, prolapse of small bowel and omentum in pleural cavity. Laparotomy. Thoractomy. Suture of diaphragm.

CASE II.—Severe abdominal contusion. Rupture of liver, spleen and diaphragm. Suture of liver. Splenectomy. Wound in diaphragm not repaired.

CASE III.—Penetrating gunshot wound of chest, perforating diaphragm, prolapse of omentum, and small bowel into pleural cavity. Laparotomy. Thoractomy. Suture of diaphragm. Recovery.

CASE IV.—Penetrating stab wound of chest, penetration of diaphragm, and injury to left kidney. Thoractomy. Suture of kidney and diaphragm. Recovery.

These cases present many interesting and important points, which I will endeavor to bring out in the course of this article.

Simple wounds of the diaphragm are not in themselves dangerous. Many cases, doubtless, recover without operation. Especially is this true of wounds of the right side, where the liver acts as a barrier against hernia. It is, however, not the injury to the diaphragm that is important, but the associate damage to abdominal viscera and the possibility in every case of diaphragmatic hernia with resulting obstruction. If we will consider that in all such cases we have to deal not only with a penetrating wound of the chest, but a penetrating and possibly perforating wound of the abdomen as well, the importance of early diagnosis and prompt surgery at once becomes apparent. In many of these cases, a correct diagnosis of the extent of the injury is arrived at with the greatest difficulty. That this is true the following cases clearly show.

CASE I.—A well-developed, well-nourished woman of eighteen years, weighing about one hundred and sixty-five pounds, was admitted to the City Hospital on February 16, at 8.55 P.M. She stated that she had partaken of a rather hearty supper,

of which corned-beef hash was the principal dish; that it had made her a "little sick," and that she was lying on a couch when her drunken husband entered, and, standing over her, fired several shots into her body.

On admission to the hospital her condition was as follows: There was no pallor nor cyanosis, lips red. She was cheerful, complained of some little pain at wound of arm and at site of injury to back. Pulse 84, respiration 26, temperature normal. She vomited her supper, which was but little digested, and remarked that she felt considerably better. There was no blood in the vomitus. (I wish to call especial attention to this point.)

Physical Examination.—As noted on the records, the history revealed the following: In the lower abdomen was a palpable, gravid uterus, abdominal walls soft, no tenderness, flanks not dull, liver margin not palpable, and dulness apparently normal. Spleen not palpable, but dulness seemed somewhat increased. Chest well developed, expansion good and equal. Breath sounds normal, no areas of dulness. Pulse regular, equal tension, and volume good, rate 84. Apex beat about three inches to left of nipple line in fifth space.

Nervous System.—As noted. "Shock seems but a small factor here. She is in good spirits, stands examination of wounds exceptionally well."

Her wounds were as follows: On the right side of chest, about three and one-half inches to the left and about one and one-half inches above the nipple, was a small bullet wound with smooth margins, while about one-half inch below and to the outside of the nipple was a smaller wound. A probe showed wounds to be connected. At about the sixth rib, and a little to the left of the nipple line, on the left side, was a small, smooth-margined bullet wound; direction could not be determined. Wound enlarged, and little finger introduced, but direction of wound could not be ascertained. There was but little hemorrhage. Posteriorly at about the sixth rib and about two inches to left of the vertebral column, was visible a palpable tumefaction, firm and hard. On deep palpation a bullet could be outlined. This was cut down upon and removed. Wound enlarged; direction not made out. No fracture of rib evident. Some pain at this point. Wound was dressed in the usual manner, chest strapped, patient put to bed, and ordered to be kept quiet.

The nurse was instructed to watch the case carefully, and to report any changes that might occur in respiration, pulse, or temperature. Diagnosis: Gunshot of right breast, penetrating wound of left chest, left forearm, and right arm.

After midnight she became somewhat restless. Pulse 102, respirations 32, temperature 99.8°. At 6 o'clock she was seen, and the following noted: Pulse 106, respirations 32, temperature 100.6°. She was resting quietly, and said she felt "fine," although she had just vomited a quantity of light-green fluid, containing some undigested food, but no blood. There was some tenderness in upper abdomen, no marked muscular rigidity, some pain in left chest. Diagnosis was made of penetrating gunshot of left chest and abdomen with possible perforation of stomach. She was immediately prepared, and sent to operation.

Operation.—Abdomen opened through left rectus muscle. Diffuse peritonitis present. Wound in diaphragm, two wounds in cardiac extremity of stomach. Wounds in stomach repaired and silk suture of diaphragm made through thorocolotomy wound. Irrigation of general peritoneal cavity. Rubber drain. Wound closed with silkworm gut.

Death second day from peritonitis.

CASE II.—A well-nourished, muscular negro, twenty-eight years old, was admitted to the St. Louis City Hospital, with a penetrating stab wound of the chest, which he had received in a drunken brawl one hour prior to admission. When examined at the hospital, his temperature was 98°, pulse 86, respirations 24. He complained of some pain in left chest. Examination of chest negative. There was comparatively no shock, and to all appearances his wound was a simple one. The wound was located between the seventh and eighth ribs, in the anterior axillary line. Examination of the abdomen negative. Voided urine without difficulty; urine clear.

Diagnosis: Simple penetrating wound of chest. Wound was sealed, and chest strapped. Twelve hours after admission, patient showed unmistakable signs of beginning peritonitis. He was immediately prepared for operation.

Operation.—Abdomen opened through four-inch incision in left rectus. Widespread peritonitis present. Wound in diaphragm found one and one-half inches in length, plugged with omentum. Large wound in cardiac end of stomach,

through which stomach contents had freely escaped. Wound in stomach and diaphragm repaired. Irrigation of general peritoneal cavity with hot normal salt solution. Drainage tube inserted in viscerorectal pouch through stab wound above pubis. Abdominal wound closed with through-and-through silk-worm gut sutures. Death sixteen hours later from peritonitis.

While an absolute diagnosis in the majority of cases is difficult, if not impossible, without exploration, as the foregoing cases conclusively show, in some cases the diagnosis is arrived at with the greatest ease. To illustrate:

A young man, twenty-four years old, a watchman by occupation, entered the hospital with a penetrating stab wound of the chest. Wound situated in left chest between ninth and tenth ribs, in the midaxillary line. On examination, omentum was found protruding from chest wound. On introducing finger through wound in chest, a wound in the diaphragm through which small bowel had prolapsed could be plainly felt. Patient was immediately prepared for operation.

Operation.—The abdomen was opened through the outer portion of left rectus muscle by an incision four inches long. A small wound in spleen was found. No other injury to abdominal viscera. Two inches of tenth rib resected; wound in diaphragm sutured with catgut. Wound in chest closed. Patient made a prompt recovery.

In a case operated on by my assistant, Dr. Kirchner, and reported by him (*Inter-State Medical Journal*, Aug., 1906), an old diaphragmatic hernia was found associated with a recent wound of the diaphragm. This complication made the diagnosis exceedingly difficult. The injuries found at operation on this patient were very interesting, and as I am able to present the specimen, which shows beautifully the diaphragmatic hernia, I will report it at length.

Patient, a white male, thirty-five years of age, of medium stature, had received a stab wound of the lower portion of the chest in the mammary line. When he was received at the hospital there was no radial pulse, both pupils were dilated, the breathing was stertorous, and he was anemic, cold, and in shock. Pressure over the abdomen was painful. There was evidence of severe intraabdominal hemorrhage.

After the usual preparation, under general anesthesia, the incision was enlarged downward, and it was found that the

penetrating instrument had severed three ribs in the mammary line, cutting through the costal margin. The abdominal cavity was filled with blood, the spleen was slightly injured, but did not bleed much. The gastrocolic ligament was severed, and there was active hemorrhage from two vessels. These vessels were ligated. The omentum was not in its normal position, but instead was adherent to the diaphragm. On further examination, an opening through which the finger could be inserted was found through the diaphragm. An incision was made in the mid-axillary line through the chest wall, and by exploring by the pleural and abdominal routes, a mass about the size of a pear could be felt in the pleural cavity. The omentum had ascended through an opening in the diaphragm into the pleural cavity, where it was confined in a sac. The hernia could not be reduced. A rubber drain was placed in the pleural cavity. The abdominal wound was closed with silkworm gut sutures.

The patient rallied somewhat after the operation, and remained conscious sufficiently long to state that he had on a previous occasion been stabbed in the chest. At autopsy the specimen of diaphragmatic hernia which I present was obtained. The hernial sac was 8 x 5 cm., and contained a great portion of the omentum, which had become adherent to the neck of the sac. The ring would easily admit the finger. It is probable that the diaphragm was only partially cut through at the time of the first injury, and that this so weakened the structure that the hernia resulted, in which the sac was formed by the peritoneal layer.

In operating for acute abdominal injuries unassociated with open wounds of the chest or abdomen, damage to the diaphragm is occasionally found. In the following complicated case, the wound of the diaphragm, situated in the dome of this muscle, well protected by the liver, was located by a distinct blowing sound accompanying respiration. The patient, a stout laborer, was admitted to the City Hospital with the following history:

Shortly before admission, he was run down by a wagon, the wheels of which passed over his body on a level with his ribs. Patient was profoundly shocked, complained of great abdominal pain, abdominal muscles rigid, dulness in both flanks. A diagnosis of intestinal hemorrhage probably due to ruptured liver was made. Patient was quickly prepared for operation.

The abdomen was opened through a median incision below the umbilicus. Peritoneal cavity was filled with blood. Examination of liver revealed an extensive rupture of right lobe, stricture extended from its lower portion three inches above, and well into the liver substance, hemorrhage severe. Wound in liver was quickly sutured with heavy catgut, hemorrhage being controlled without great difficulty. The spleen was next examined and found to be the seat of an extensive rupture, bleeding profuse. The left rectus was quickly cut across, and the spleen was removed. Copious irrigation of the general peritoneal cavity with hot saline solution was made. The abdominal wall closed through and through with silkworm gut sutures. Patient recovered.

From a careful analysis of the cases coming under my observation, I am convinced that there are present in but few of them, symptoms on which the positive diagnosis of injury to the diaphragm can be made, and that in many cases, where extensive injuries to the abdominal viscera are present, the patients are apparently in excellent condition, and present practically no symptoms. I, therefore, believe, that in all penetrating gunshot or stab wounds of the chest where, from the location of the wound, it is reasonable to conclude that injury to the diaphragm is possible, the existence or non-existence of such injury should be determined by proper exploration. Positive symptoms in these cases are generally the signals of peritonitis, and peritonitis of this character is usually fatal.

If this view is correct, how shall we explore, through the chest or through the abdomen? A penetrating wound of the diaphragm is a penetrating wound of the abdomen, and an exploration to determine the presence of such an injury which does not enable the operator to repair, if present, the associate injuries to the abdominal viscera should not be undertaken. To sew up an injured diaphragm and leave a perforated bowel or stomach, would certainly prove disastrous. Through an abdominal incision, the extent of injury to both diaphragm and abdominal viscera can be absolutely determined. If it is found that the wound in the diaphragm is so situated that it cannot be repaired through an abdominal incision, thoractomy can be done, resecting an inch or two inches of rib. With the hand in the abdomen, the diaphragm can be pushed into thoractomy wound, as is shown in Fig. 1,

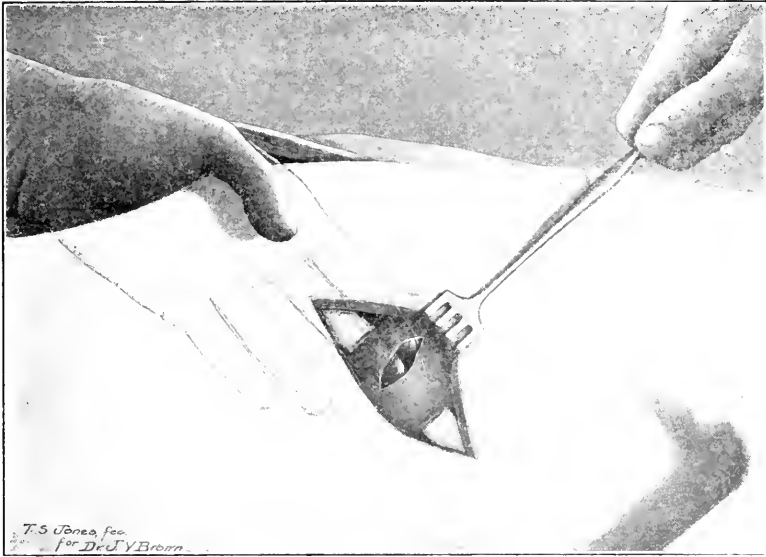


FIG. 1

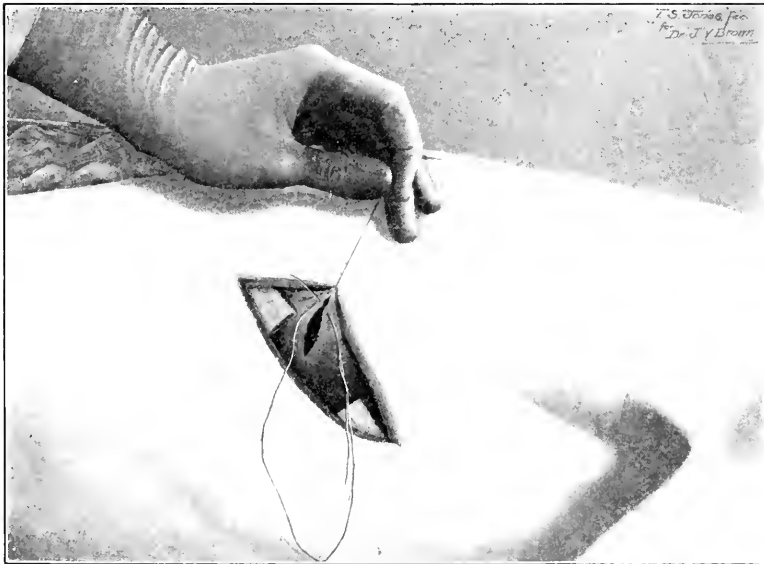


FIG. 2

making the work of repair quite easy. A method which I have found very useful in dealing with injuries of this character is nicely shown in Fig. 2. It consists of leaving both ends of the first suture long, using one as a tractor.

This method enables the operator to work through a very small incision, and will frequently do away with the necessity of resecting more than a portion of one rib.

In conclusion, let me say that the mortality in this work will always be high. Many of these patients are mortally wounded when seen by the surgeon. There are, however, quite a number whose injuries can be repaired with satisfactory results if operation is undertaken early. I, therefore, urge that more attention be paid to penetrating wounds of the lower chest, and that early exploration be undertaken as a routine procedure in all cases where injury to the diaphragm is suspected.

CITY HOSPITAL.

TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

*Nineteenth Annual Meeting, held at The Hotel Havlin,
Cincinnati, Ohio, September 20, 21, and 22, 1906.*

The President, JOHN YOUNG BROWN, M.D., in the Chair.

KIDNEY AND COLON SUSPENSION BY THE USE OF THE NEPHROCOLIC LIGAMENT AND GEROTA'S NEPHROCOLOPEXY CAPSULE.¹

BY

H. W. LONGYEAR, M.D.,

Detroit.

(With two plates.)

At the annual meeting of the Michigan State Medical Society, held at Petoskey, in June, 1905, the writer, while discussing Dr. Aaron's paper on floating kidney, asserted that he had discovered a cause for dislocation of the kidney by the presence of a distinct union between kidney and colon.² Later, in New York, one year ago, in his presidential address before this Association,³ he described this anatomical union in detail, and exhibited specimens and photographs in support of his contention. On both of these occasions he also mentioned an operation for nephroptosis, which he then had in course of development.

The object of this brochure is to again describe this ligament with added observations recently made on both the cadaver and the living subject, and also to give the technic of the operation referred to as now performed by him.

The nephrocolic ligament is formed by an aggregation of

¹ Presented at the nineteenth annual meeting of the American Association of Obstetricians and Gynecologists, held at Cincinnati, September 20-22, 1906.

² *Jour. Mich. State Med. Soc'y*, Vol. V. No. 1, p. 41.

³ "A Study of Floating Kidney with Suggestions Changing the Operative Technique of Nephropexy." *Trans. A. A. O. & G.*, 1905.

fine fasciculi, originating in and being identical with the fibrous tissue forming the framework of the fatty capsule of the kidney which, after enveloping the kidney in a fine network, passes downward and is inserted into the posterior wall of the ascending colon on the right side, and the descending colon on the left side. Its structure, as well as its action, may be compared to that of the network covering a balloon, the cords of which extend downward and support the car. The kidney is the balloon and the cecum the car.

The kidney descends or not, according to the laxity of its supports and the degree of traction exerted on it by the cecum. The cecum consisting of a sac with its outlet upward, the contents of the viscus must be always forced in that direction, which necessitates the application of tractile force in the opposite direction, and as the nephrocolic ligament is a firm and unyielding attachment, the kidney is pulled downward. When to this natural downward traction of the bowel is added the weight of a full torpid cecum, distended with more or less impacted fecal matter, the force applied to the downward movement of the kidney will be still greater. The violent efforts of the bowel to unload itself, when so distended, aids materially in the completion of this etiologic factor. The action of the colon on the left side is in the opposite direction, as the contents are there forced downward, hence the left kidney is so rarely pulled out of its normal position. When the right kidney is pulled downward by the ascending colon, it pulls with it the duodenum by reason of the adhesion of this intestine to the side of the fatty capsule, and this action probably causing a kink in the bowel, explains the presence of digestive symptoms in cases of prolapse of the right kidney. Prolapse of the left kidney, alone, is exceedingly rare, and when it does occur from any cause, except trauma, gives practically no symptoms. As there are fifteen cases of floating kidney of the right side to one of the left, there must be some good reason for the great difference. The presence of the nephrocolic ligament and the action of the ascending colon and cecum explain this in the most satisfactory manner. As a purely mechanical proposition it cannot be refuted if the presence of the ligament is admitted. That it is present and has come to stay as an anatomic entity is demonstrated not alone by the writer, but by others now working along the same lines

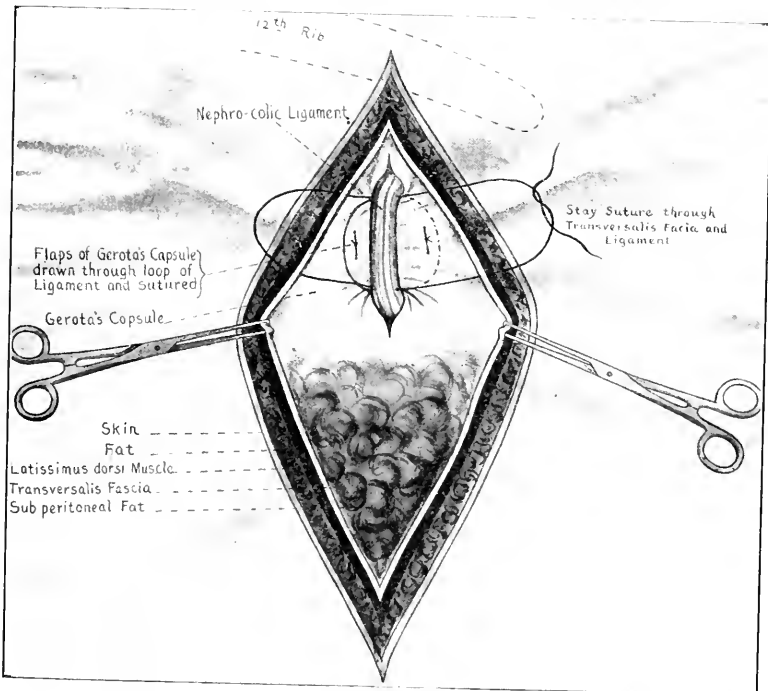
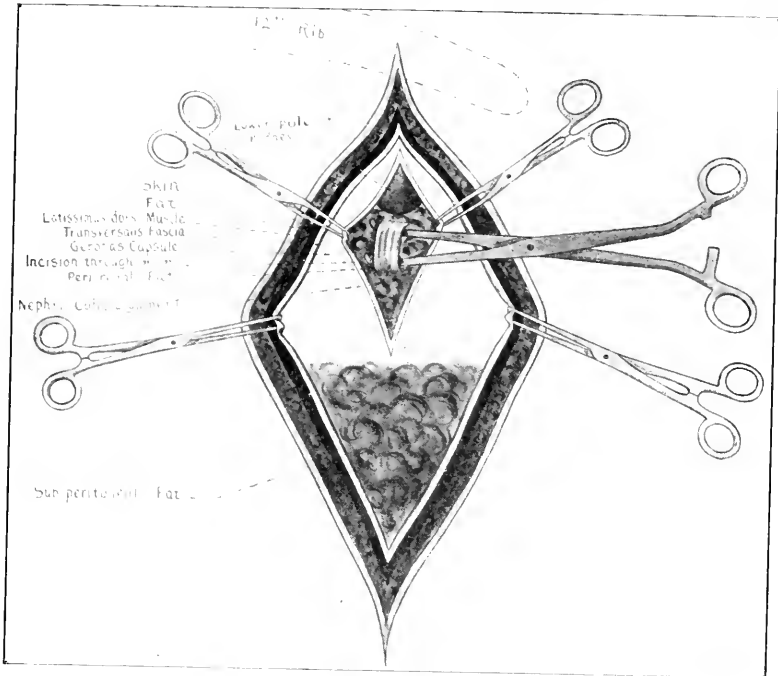
The presence of the structure is easy to demonstrate in an emaciated subject, as all fat will have disappeared from it, leaving only the fibrous network surrounding the kidney and passing down to the posterior wall of the bowel.

In the demonstration of its presence, the method of dissection observed by the writer is as follows:

The entire width of the abdominal wall is incised transversely, just below the ribs, and downward on each side to a point about two inches below the anterior-superior spine of the ileum. The abdominal wall is then turned downward, giving free access to the colon on each side. On the right side, the colon at the hepatic flexure and the ileum near its junction with the cecum are tied and cut through; then the peritoneal attachments of the cecum and ascending colon on each side of the gut are severed. The hand can then be passed under the gut and further on to the kidney, which is pulled down and its attachments severed, with the remaining uncut peritoneum which covers it. On turning over the detached specimen, consisting of cecum and ascending colon and kidney, all covered anteriorly by peritoneum, the union of kidney and bowel is plainly seen. If the subject be fat, the ligamentous character of the union will be obscured by the adipose tissue contained within it. In the thin subject it is very marked. The quantity of tissue composing it varies in amount considerably in different subjects, being fuller and stronger in cases of nephroptosis of long standing, its increased size probably being the result of the long-continued traction to which it has been subjected. Heredity also may have to do with a strong nephrocolic ligament as well as with a loosely-placed kidney, the combination of which results in the displacement of the organ.

The organs of the left side may be removed in the same manner after severing the colon above and below. The ligament on the left side is placed the same, but is not so uniformly regular and strong as on the right. This variation has been especially noted by the writer in the dissection of the newly-born infant.

When we consider the action of the cecum in pulling down the kidney by reason of the presence of this ligament, the question of the utilization of the ligament for the purpose of supporting both the bowel and kidney naturally presents itself. The writer first accomplished this by sewing a loop of



FIGS. 1 AND 2.

LONGYEAR—KIDNEY AND COLON SUSPENSION BY THE
NEPHROCOLIC LIGAMENT

the ligament to the incised edges of the transversalis fascia, close to the twelfth rib, using for the purpose a mattress suture of fine silver wire. This seemed to accomplish the purpose, but a more ideal method suggested itself on one occasion while isolating Gerota's capsule during an operation for fixation of the kidney and bowel.

As the modern text books teach us, Gerota's capsule is formed by the splitting of the subperitoneal aponeurosis, one layer of which passes in front of the kidney across to the opposite side, to be continuous with that passing in front of the other kidney, while the posterior layer passes behind the kidney and is inserted into the vertebræ. The wall of the capsule, which is situated outside of the fatty capsule, is thin, but of good tensile strength, so that on incising it to draw the nephrocolic ligament through, the firmness and fixity shown by the portion passing down behind the kidney from its vertebral insertion was seen to present the best possible tissue for use in fixing the ligament. By drawing the incised edges through the loop of ligament, from each side, and making them broadly overlap each other and suturing them in this position, a firm sling was found to result, which seemed ample for the support of the bowel and kidney. To insure the firm union of this aponeurotic sling, the loop of ligament was stitched to the upper angle of the opening in the transversalis fascia.

This operation was made January 8, 1906, and since that date nine more have been done by this same method. The results thus far are satisfactory, but of course more time and a greater number of cases will be necessary to give statistical value and standing to the operation.

The technic followed is as follows: incision of two and one-half to three inches long, beginning just outside the quadratus lumborum muscle, at the twelfth rib, and passing diagonally downward toward the ilium, through skin, fat and superficial aponeurosis to the latissimus dorsi muscle; blunt dissection through muscle parallel with its fibers; incision of transversalis fascia and its isolation by rat-tooth forceps, one on each side; pushing downward subperitoneal fat; incision of Gerota's capsule and isolation of its edges by tissue forceps, one on each side; grasping and raising nephrocolic ligament with long rat-tooth forceps, directed by finger against lower pole of kidney; gathering up ligament with blunt hook for-

ceps passed around it forward of the forceps; liberation of the loop of ligament from peritoneum by opening forceps; drawing through margins of Gerota's capsule, overlapping and suturing under loop of ligament; closing transversalis fascia, with loop of ligament sewed into upper angle, close to twelfth rib; closing balance of wound.

For suturing material, twenty-day, number two, chromicized catgut has been used. In some of the earlier cases, one mattress stitch of silver wire was used to attach the loop of ligament to the transversalis fascia. The buried suture method was used in all cases. Patients are kept in bed three weeks.

An abdominal band, with a thick pad placed below the navel, is applied at the time of operation, and the patient is instructed to wear this for three months.

Gerota's capsule is easily isolated in the upper angle of the wound, after pushing down the superimposed subperitoneal fat. It is of a pinkish color, thin and tough, and somewhat resembling the peritoneum in appearance. It should be sought for in the upper angle of the wound, as it will often be missed at the lower angle and the peritoneum incised instead. This error can then be seen at once, as no perirenal fat will bulge through the opening, as takes place on incision of the capsule.

The isolation, by rat-tooth forceps, of the transversalis fascia and Gerota's capsule, as these tissues are incised, is for the purpose of quick identification later in the operation, as the writer has found that, otherwise, the several layers of fat quite cover and obscure them in some cases.

In uncomplicated cases, the writer finds no necessity for opening the peritoneal cavity while following this plan of operation, as the isolation and opening of Gerota's capsule renders the nephrocolic ligament easy of access.

Advantages of the operation: mutilation of the parts is slight, so that if failure result by reason of suppuration or other cause, no injury can follow; the kidney is held in a natural, partially movable, manner, allowing of the necessary limited motion which is present normally; the bowel is suspended also, which prevents its farther traction on both the duodenum and kidney (which the author considers the most important attainment of the operation); pain following the operation is very slight, and convalescence comfortable.

These advantages are such that in the opinion of the writer,

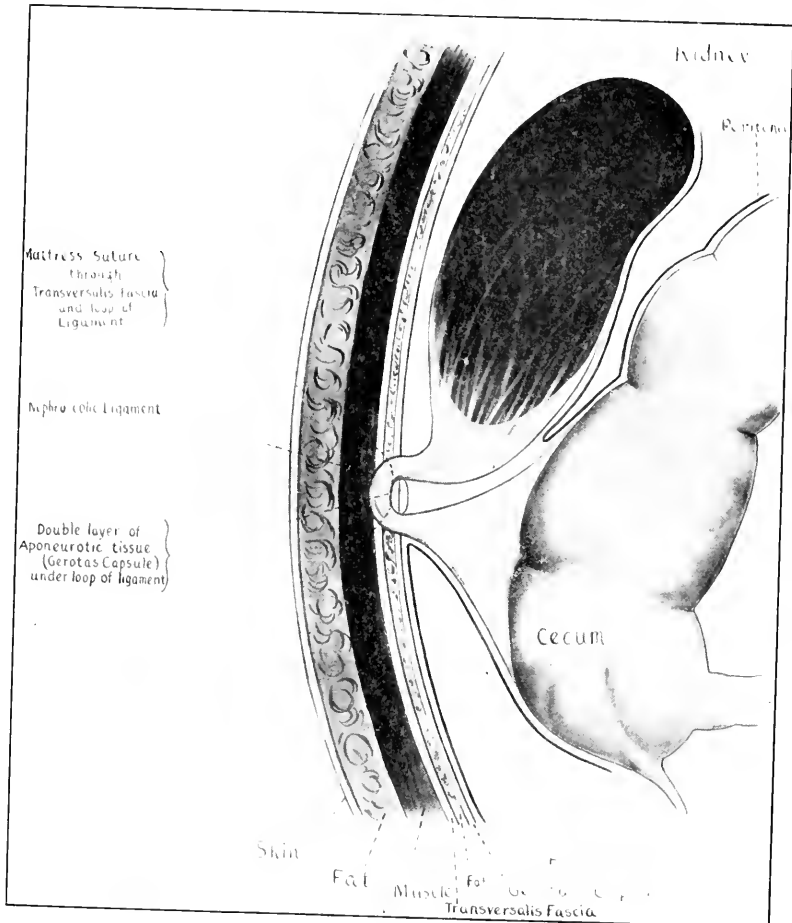


FIG. 3

LONGYEAR—KIDNEY AND COLON SUSPENSION BY THE
NEPHROCOLIC LIGAMENT.

the operation may be resorted to much more freely and with less hesitation than is the custom in consideration of the old operation of nephropexy, which is more mutilative, painful, and so frequently disappointing.

PRELIMINARY REPORT OF CASES.

CASE I.—Mrs. W. Patient referred by Dr. Florence Huson. Operation at Woman's Hospital, January 8, 1906. Recent examination by Dr. Huson showed kidney in good position and patient much improved.

CASE II.—Miss R. (sister, mother and grandmother known by the writer to have floating kidney). Operation at Harper Hospital, January 10, 1906. Recent examination showed kidney in good position, the lower pole palpable below ribs on deep inspiration. Symptoms of indigestion, nervous depression, backache, etc., entirely gone, and patient able to walk long distances without distress or fatigue, and bowels now regular.

CASE III.—Mrs. T., sister of Case II. Operation at Harper Hospital, February 1, 1906. Slight suppuration of wound. Patient suffered a bad fall soon after leaving the hospital, which was followed by severe pain in region of kidney. When seen two weeks after the accident the kidney was again displaced. Patient is now much improved in every way, is gaining in flesh, can endure fatigue, and says digestion and nerve force are improving constantly and defecation normal. The kidney probably slipped through the fatty capsule, leaving the bowel suspension intact, which latter condition doubtless causes the improvements and sustains the theory of the writer as to the rôle played by the displaced bowel.

CASE IV.—Miss A., a nun, referred by Dr. Coddieux. Operation at convent, March 13, 1906. Aseptic conditions bad, causing sepsis and free suppuration of wound. Recent report was that the kidney was down and all symptoms returned.

CASE V.—Miss N., referred by Dr. G. Potter. Operation at Harper Hospital, March 12, 1906. Dr. P. reports kidney in good position, lower pole palpable on deep inspiration, but patient's symptoms—principally backache—not much improved.

CASE VI.—Mrs. B.; patient referred by Dr. Repp. Op-

eration at St. Mary's Hospital, March 17, 1906. Dr. Repp reports the operation a success in every way.

CASE VII.—Mrs. G. Operation at Harper Hospital, June 5, 1906. Reports digestion and nervous symptoms much improved.

CASE VIII.—Mrs. P.; referred by Dr. F. L. Newman. Operation at Harper Hospital, June 5, 1906. Examined September 16, 1906. Kidney in good position and all nervous and digestive symptoms improving; gaining in flesh.

CASE IX.—Miss D.; referred by Dr. E. S. Sherrill. Operation July 3, 1906. Reports improvement; at work as stenographer; not examined.

CASE X.—Mrs. B. Operation September 18, 1906; too recent for report.

271 WOODWARD AVENUE.

DR. CHARLES A. L. REED, of Cincinnati, Ohio, read a paper on
FIXATION OF THE KIDNEY BY SHORTENING OF THE NEPHRO-
COLIC LIGAMENT; WITH REPORT OF CASES.¹

THE TECHNIC OF KIDNEY FIXATION.²

BY

J. H. CARSTENS, M.D.,

Detroit, Mich.

A MOVABLE kidney, no matter what the degree or the mobility is, causes more or less distress, as a general rule, and although sometimes by the development of adipose tissue the distress is lessened, or by wearing a belt some relief is obtained, there can be no permanent and lasting cure unless the kidney is properly fixed as near to the normal position as possible.

Many methods of more or less value have been devised. Originally the fatty capsule was attached to the muscle; or the kidney was more or less stitched by sutures placed directly through its substance; or the kidney was scraped and partly denuded so that it would become attached. Then it was advocated to

¹ Paper not received.

Presented at the nineteenth annual meeting of the American Association of Obstetricians and Gynecologists, held at Cincinnati, September 20-22, 1906.

stitch the fibrous capsule (after splitting it) to the muscle. Later on, Senn suggested the method of getting the kidney to the line of incision with gauze and permitting it to heal by granulation. The latest is the Longyear nephrocolic ligament.

All methods have been successful and all have been failures. The latter is often due to lack of thorough examination of the patient or not considering other conditions or symptoms, especially general abdominal ptosis. This condition often causes all the symptoms, and fixing the kidney does not relieve the patient, so that it is very necessary in making a prognosis to be sure that the kidney is at the bottom of the trouble and produces all the symptoms. This point I cannot emphasize too strongly.

After trying all the other methods, except the last mentioned, years ago, I finally came to the conclusion that splitting the fibrous capsule of the kidney and attaching the latter to the muscle, was the best method. For more than ten years I have practised this plan with uniform success. As stated in an article published last spring, in my earlier operations I made the incision at the outer edge of the quadratus lumborum and found that I did not get the kidney high enough, and that the clothes at the waist sometimes pressed the lower edge, so I came to the conclusion that the best incision was at the outer edge of the erector spinæ muscle. I place the patient on the side opposite to that on which I am going to operate, with a large sand bag under the waist line, and the knees well flexed on the abdomen. I prefer this, as a rule, to placing them on the abdomen, as some do. I always, figuratively speaking, use chloroform in operating on the kidney. The patient being prepared in the usual manner and in position, I make an incision from the lower edge of the ribs downward to the crest of the ileum, about one and one-half inches long, through the skin down to the muscle. Either with the handle of the knife or the finger I now separate the muscle and thus have little or no hemorrhage. Sometimes a fascia has to be cut, but generally one can do everything with the handle of his knife and finger. Being now back of the peritoneum one can get hold of the kidney. If it floats around or is down in the pelvis, as it sometimes is, the assistant can put it into place and hold it with his hand. Through the small incision one can generally separate the fatty capsule, more or less, and reach the kidney itself.

I have tried various instruments to seize the kidney, but they did not work, except the two-pronged tenaculum forceps. It does not seem to injure the kidney to put the forceps through its substance. One then has absolute control over it. Separate the balance of the fatty capsule and bring the kidney up to the opening. With a knife make a long incision through the fibrous capsule lengthwise. If one cuts into the kidney itself it will do no harm. It may cause a little bleeding, but after a little practice one will not do that very often. With a small artery forceps take hold of the fibroid capsule on one side and with another artery forceps seize it on the other side. I generally take hold of one side at the upper end of the wound and then with the other on the lower end of the wound. Having firm hold of the kidney now by the forceps one may remove the tenaculum forceps and with the finger between the kidney and the capsule can loosen the latter all around down low, tearing the capsule still more if necessary, with the finger. One cannot do much in the way of loosening the capsule. A firmer attachment is secured. With a good hold on the fibrous capsule, I put in a couple of dry, sterilized catgut sutures and attach it to the muscle on one side; the other end of the fibrous capsule I generally turn a little inward so that the kidney can unite as firmly as possible. I then put in a couple of stitches where the other forceps holds the capsule and attach that to the muscle at the opposite side of the wound, and also turn in the other end of the fibrous capsule. I run two or three sutures to bring the muscle into apposition. The skin only can be closed with a fine catgut suture, or, as I usually do, with a few strips of adhesive plaster, bringing it into careful apposition. I then take two inches of zinc oxide plaster, starting at the middle of the spine and lay it forward to practically cover the wound and then around the waist in the front of the abdomen up to the umbilicus. This should act as a kind of buffer during the vomiting and retching which sometimes occurs on the first day.

Light diet is given for a few days, after that anything may be eaten, but patients must stay in bed fifteen days. After a few days they can lie on that side where the kidney has been attached. If both kidneys are operated on at the same time they must lie on the back for the whole time. In fifteen days they are allowed to sit up, the next day to walk around, and by

the eighteenth day I allow them to go home. The wound heals by first intention. I take the plaster off in about two weeks and apply another, which they keep on when they go home, and they can remove it themselves after a few weeks.

This operation is simple and can be done in ten minutes through a very small opening. It gives permanent results, and seems to me to be the ideal method of permanently fixing a kidney.

620 WOODWARD AVENUE.

These three papers were discussed jointly.

DISCUSSION.

DR. HERMAN E. HAYD, of Buffalo, in opening the discussion, said that he did not know of a class of operations which had been so disappointing as the ordinary ones for floating kidney. He never knew why these operations failed. He gradually evolved for himself an operation which he thought was satisfactory. First, opening the fatty capsule and expecting then that the kidney would adhere to the back, and closing the wound. In some of the cases the kidney adhered to the back and he succeeded satisfactorily, while in others this operation failed. That induced him to go a little further, and then he began to sew the kidney to the wound, to transfix it. Some of these operations were attended with success, while others were followed by failure. Then, by reason of the work of Morris, he split off a portion of the capsule and sewed it to the edges of the wound. Some of these cases were satisfactory, while others were failures.

He complimented the work of Dr. Longyear, who had so modestly presented the question of the nephrocolic ligament, and who had been so splendidly supported by Dr. Reed. He was satisfied, however, that from now on he was going to do the operation described by Dr. Reed. Why? Because when we had a pronounced case of floating kidney, there were two factors in that case—namely, a separated kidney, and a separated cecum and ascending colon. He did not think it was possible to fasten a kidney unless it was delivered so as to produce a certain amount of adhesive union between the kidney and the loose structures which it had occupied so long. Many of the cases of floating kidney were the subjects of parenchymatous nephritis; and unless these kidneys were delivered and examined, it was not possible to tell exactly what their condition was. He thought the essayist had developed an ideal operation for floating kidney—namely, to deliver the kidney, split the capsule if it was necessary, cut the nephrocolic ligament, hoping, by reason of the irritation of the kidney, to produce adhesive union, and by picking up the nephrocolic ligament, and sewing it as Dr. Reed had done, the prolapse was lifted up. In the future he was going to work on the lines that had been

indicated. Anatomically and clinically, both Doctors Longyear and Reed were working on the proper lines.

DR. EARL HARLAN, of Cincinnati, Ohio, by invitation, called attention to the very wide range of pathological anatomy attendant upon kidney dislocations and showed that any operative procedures, which had for their intention the correction of the numerous symptoms which waited upon this trouble, must be based upon a correct rearrangement of the normal anatomy of the parts in the right upper quadrant of the abdomen. It was the consideration of this feature which led to his devising an operative technic, which, he thought, was satisfactory, inasmuch as it was based on the normal anatomy of this region. A dislocated kidney was one in which there was a pathological separation of the peritoneum and bowel from the back, allowing the kidney to fall downward from its natural resting-place, impinging upon the abdominal viscera in its descent, and interfering with both the normal functions of the kidney and the physiology of digestion. There might or might not be an elongation of the peritoneum in front of the point of pressure. The abnormal position of the kidney under these circumstances might be any one or all of the following, these being modified by the normal placement of the kidney, which varied in different subjects, and the conditions of resistance, which varied under circumstances within the abnormal cavity. In long-waisted subjects, where the kidney normally rose above the hepatic flexure, it might in dislocations descend and catch immediately on top of the flexure, thereby gradually crushing and mashing down the bowel to such an extent as to lead to conditions which would cause partial or complete obstruction, the latter becoming at times acute. In this case the flexure would be found low down, the ascending colon crowded down, and out toward the lateral lumbar region, and the cecum would rest tightly against the right flank, while there might or might not be all the evidences of appendicitis. The operative procedure indicated in a case like this would be a firm reattachment of the flexure to the back, with a shortening and reattachment of the peritoneum below and in front of the kidney. In those cases in which the kidney slipped down immediately behind the bowel, sometimes into the right inguinal region, the peritoneum and bowel at the junction of these two should be sutured to the lumbar fascia. In those cases in which the kidney separated the posterior layer of the outer fold of the peritoneum from the back, and in which the kidney slipped downward and outward toward the anterior-superior spine of the ilium, impinging upon the lumen of the bowel and dragging upon the peritoneum, the cavity beneath the latter should be eliminated by a T-shaped process of suturing, the lower arm running up along the outside of the bowel, and the top of the T running from the lateral lumbar region across to the bowel

inside. In some cases the kidney would descend for a short distance, at which it would encounter resistance in the shape of a better peritoneal attachment, then turning on its own axis the lower pole would protrude directly into the lumen of the bowel. The same thing might happen to the upper pole; it might occlude the bowel instead of the lower one, which latter was the usual order in dislocations of this nature. Other variations occurred in dislocated kidney, all of which should be met with logical methods of treatment.

The speaker said that he had cured many of these cases by the application of the bandage and pad described by him in an article published in the *Cincinnati Lancet-Clinic*, July 22, 1906. For those which demanded operative treatment, he applied his own operative methods, which had been published. No stereotyped operative measure would apply in the relief of this trouble, but rather a correction of the entire pathology produced by kidney dislocation was indicated. In order to succeed in this, no operative procedure done through the lumbar incision could be effective, as it was impossible to distinguish through this incision the relations and conditions of the viscera in the wall of the bowel from the parietal peritoneum. The incision for dislocated kidney should be made in front, beginning at the external border of the rectus muscle, and running parallel with the lower border of the ribs, terminating at the lateral lumbar region. Such an incision gave one an opportunity to explore all the organs concerned in the symptomatology of a dislocated kidney, including the gall-bladder and ducts, biliary, hepatic and common, the duodenum, when the outer fold was incised, the cecum, appendix, ascending colon and hepatic flexure, and the peritoneum itself. This incision so simplified the trouble as to make its correction a matter of no moment. It also enabled one to remove gallstones and drain the gall-bladder if this was necessary, or if a mistake in the diagnosis had been made. All future operations done by himself for all kidney troubles, except possibly in cases in which there was suppuration of the kidney, as well as those done for the relief of gall-bladder troubles, would be done through this incision. Another good reason why he would use this incision in the future was because in all cases of dislocated kidney which had come under his observation to date, the gall-bladder was implicated, and generally speaking the reverse was true. In most short, stout subjects, in whom there might be present a dislocated kidney, the latter organ lay directly behind the colon. In these cases there could be no imbrication of the peritoneum between the kidney and colon, the nephrocolic peritoneal fold. Operative relief, therefore, based on this procedure would be absurd, founded as it was on impossible anatomy. This procedure was but one of a number of measures devised by himself in an effort to tabulate a stereotyped method of operative technic, to be used in circum-

venting the numerous pathological phases assumed by a dislocated kidney.

DR. JAMES F. BALDWIN, of Columbus, Ohio, said that ordinarily, in anchoring a kidney, he had taken particular pains to open the peritoneum after removing the peritoneal fat, getting the kidney up out of the way. He had done this in order that he might examine the condition of the appendix. He had done it particularly since the publication of Edebohls's article some years ago, in which he called attention to the great frequency with which chronic appendicitis was associated with movable kidney. It was very easily done. One could bring out the appendix and remove it, if it was found diseased. The peritoneum was stitched with a few stitches of catgut, brought down, and the conditions then were in shape to proceed with the operation.

In operating on the kidney and in other operations in which he used catgut, he never used a size larger than No. 1 chromicized. If properly prepared, it could not be broken by the ordinary force which one applied with the hands. Laboratory experiments had demonstrated repeatedly that the difficulties of sterilization increased with the size of the gut. It was much more difficult to sterilize No. 2 than No. 1 catgut; likewise more difficult to sterilize No. 3 than No. 4 catgut; consequently, for many years he had used nothing larger than No. 1 chromicized, and he did not think he should use anything larger.

Some years ago (he did not remember the exact date, but thought it was in 1898 or 1899) he contributed to the *Journal of the American Medical Association* a brief description of a method which he had been using then for some time in anchoring kidneys. Later, a New York surgeon described the same operation without giving him any credit. He contributed a short article to the *Medical Record*, calling attention to priority of publication, and also to what he regarded as an improvement in technic. This improvement was illustrated by a diagram on the blackboard.

As to the nephrocolic ligament, after returning from the New York meeting last year, within a week he wrote Dr. Longyear in regard to it. He anchored a kidney, and found the Longyear or nephrocolic ligament, which he utilized after his (Longyear's) technic, and so far as he knew with a perfect result. But since then, in only one or two cases had he found such a ligament he thought he could safely utilize. However, in the majority of cases in which he had anchored kidneys since then, he had resorted to this method.

A week or two ago he operated on a patient for inflammation of the gall-bladder upon whom some three or four years previously he did this operation, and took advantage of making an incision that admitted his hand to examine both kidneys. This he did, and it was exceedingly satisfactory to

know how nearly in a physiological position the kidney was, with almost its normal range of mobility. It was partially fixed. However, there was a reasonable amount of play, although when the woman was on the table and he was examining her, he was not able to feel more than the lower tip of it during deep inspiration.

DR. JOHN B. MURPHY, of Chicago, was asked to discuss the papers. He said he was very much interested in the presentation of the subject by Dr. Longyear, and in the paper of Dr. Reed. He had nothing to say with reference to this particular operation. It seemed to him, however, to be based on sound principles. He was anxious to find some easier method than the one he was at present using. He could say, however, for the Chicago surgeons, that they were anchoring kidneys so that they remained in place.

DR. JOSEPH PRICE, of Philadelphia, said the method described by Dr. Carstens, from a purely anatomical and surgical standpoint, was most radical. Anchoring of the kidney was a rare operation with him. He began in septic zones of the abdomen and remained there with his surgery. Occasionally he was asked to do an operation on kidney cases, but he would rather turn such patients over to other surgeons, if possible to do so. A great many operators throughout the country were anchoring pathological kidneys; they were anchoring a prolapsed kidney in the midst of grave pathology. He had been horrified to find suppuration of the gall-bladder in some of these cases involving the kidney, or there was an incipient tubercular kidney that had been anchored. Last summer he found five cases. He went to Virginia and found a patient who had undergone five operations. Some surgeon had removed her appendix. Later he discovered that the kidney was at fault. The surgeon did a posterior operation, which failed to anchor the kidney. This surgeon was prominent. He did an anterior fixation of the kidney and colon, after which the speaker incised the kidney, and removed a stone and pus. He operated on five patients, in whom the pathological condition was so marked that he removed gallstones through an incision in the kidney that had been anchored. One of the patients he had referred to was operated at the Hopkins. There they first did a posterior fixation of the kidney; later anterior anchorage, and he removed from that woman a large pathological kidney. It was not pleasant to repeat operations where one found fore and aft anchorage, giving scar tissue, shock, and increased hemorrhage in one's surgical work—things which favored a mortality that surgeons disliked. He emphasized the point that a great many surgeons were still anchoring pathological kidneys. He had not done the operations referred to by Drs. Longyear and Reed.

DR. LONGYEAR, in closing the discussion on his part, said

he was very much interested in the paper of Dr. Reed with reference to the method he had described, and also his method of treating the stump. He noticed that he sewed it in after he had cut it; but now he sewed both ends and effected a cure in that way more than he did by the friction of the kidney and causing complete fixation of the kidney itself. He did not believe it was necessary to make a solid fixation of the kidney. All that was needed was to relieve tension produced by the union of the bowel and kidney.

Dr. Hayd spoke of the delivery of the kidney as being necessary. Probably it was essential if the patient had any symptoms of disease of the kidney, but he believed it was possible for any good diagnostician to make up his mind whether he had a suspicion of disease of the kidney or not. If he had, he should deliver the kidney and examine it. He believed, however, that most surgeons could determine whether there was disease of the kidney or not before operation without really handling the kidney. The urine would show it, and an examination of the kidney would usually show it. If there was any sign of disease of the kidney it should not be anchored until that question had been settled. If it could not be settled otherwise, it should be settled through an exploratory incision. A pathological kidney should not be anchored. The probabilities were that in Dr. Hayd's cases failure was due to the fact that he grasped the fatty capsule at the lower part. If he had grasped it below the kidney, it would not have torn, for the simple reason that the kidney has a network above, the fibers passing in various directions, and they were weak. If we took them below, where they coalesced and came down parallel with each other, they had a good deal of tensile strength.

He thought if Dr. Carstens ceased using his double tenaculum and took hold of the nephrocolic ligament he would handle the kidney without wounding it. At any rate, he would be able to handle it to better advantage.

As to there being no nephrocolic ligament, he said he mentioned in his paper that it varied in some cases. In examining a cadaver he at first thought there was no nephrocolic ligament, but by a more careful examination he found it was spread out upon the peritoneum in a rather unusual manner, so that it was very thin, but when he took hold of the peritoneum with it it was quite thick. In such cases it might be difficult to separate from the peritoneum. One might have to take peritoneum with it to get it, but it was there. One would find it in the newborn infant as a fine bundle of filaments running downward, and in every case he had examined, it was there. In the fat subjects it was obscured by the fat, which distended it; but it was there, and by bunching it up together it could be used.

As to the use of catgut, he had found in his surgical work that the different numbers of catgut differed slightly with different makes or preparations. He had been using the Van

Horne catgut for this work because he considered it more reliable as to size and durability. He had experienced a little difficulty with No. 1 catgut, for when it was soaked a little while it would break easily; No. 2 did not, and so he had been accustomed to the use of No. 2, which he boiled before using.

DR. REED, in closing, on his part, said that the operation he had described simply happened to him, and he was satisfied with the results.

As to the nonexistence of this ligament, he would simply say that since his attention had been called to it, he had never failed to find it, and he had certainly not found it when he did not know it existed. He was impressed more and more, since he had heard Dr. Longyear explain why this ligament ought not to be divided, that it ought to be divided, and nothing convinced him so conclusively as the diagrams. There was established a purely inflammatory connection between this ligament and the fascia.

DR. CARSTENS, in closing the discussion, said his object in writing his paper was to call attention to the fact that there was no one definite or distinct cause for loosening of the kidney; that the ligament mentioned did not pull down all kidneys, and that there was no particular method of operating on these cases. A kidney would become loose of its own accord. It might become loose on account of the patient falling from a step-ladder, or falling off a bicycle. There might not be anything else the matter with the patient. We knew the kidney was loose, but did not know what gave way, whether it was the nephrocolic ligament or something else. In such a case he wanted to fix the kidney, because he believed the looseness of the kidney with its intimate relation to the solar plexus caused irritation of the sympathetic system of nerves and remarkably diverse symptoms in some cases simply by pulling and dragging on the solar plexus. If such a kidney was fixed, the patient would improve, and in a short time she would be well.

In his paper he emphasized the importance of a floating kidney not being the only condition of which many patients complained. Even though some surgeons fixed the kidney and it remained in place, the patient was not well, because the practitioner did not make a correct diagnosis. He did not look beyond the floating kidney.

An important point in connection with this subject was the question of diagnosis. A floating or loose kidney, with no other pathological condition, was a rare thing. Such cases were not very common; they were generally complicated with gallstones, appendicitis, stenosis of the stomach, etc., and such conditions were often overlooked. If the surgeon had a loose kidney to deal with, and the patient had a diseased ovary, the diseased ovary should be removed just the same as the surgeon would remove the appendix, if it were found to be diseased or any other pathological condition that was met with.

PORRO-CESAREAN SECTION FOR PREGNANCY, WITH
COMPLICATING FIBROIDS.¹

J. F. BALDWIN, A.M., M.D.,

Columbus, Ohio.

Surgeon to Grant Hospital.

At the meeting of this Association, in 1899, Dr. Rosenwasser presented an excellent paper, reporting four cases of uterine fibroids complicating pregnancy. In the opening paragraph of his report, he states that "previous to the advent of abdominal surgery and antiseptic midwifery, more than one-half of the mothers and two-thirds of the children died," in cases in which uterine fibroids constituted a complication in pregnancy. Under careful antisepsis and improved technique, he adds, the maternal mortality had been reduced to 37 per cent. in cases in which there was no intervention before labor. He therefore very truthfully says, "the management of this grave complication is still at fault. * * * The loss of mothers ought not to exceed 10 per cent.; the viable children ought nearly all to be saved."

The importance of this complication was very forcibly impressed upon me last summer:

Patient, aged 33½ years; married seven years; physician, Dr. Louis Kahn; February 21, was seen at her residence. Was then supposed to be about seven and one-half months advanced in her first pregnancy. She had consulted her physician some three months before, and he had at that time discovered in addition to the pregnancy the presence of a number of fibroids. The tumors had been growing steadily with the development of the uterus, and for a number of weeks the patient had complained of general soreness and tenderness throughout the abdomen, for the relief of which she had been given codeine, but with no very satisfactory results. She slept poorly, and looked haggard. Examination showed no fibroids in the region of the cervix, but a considerable number of fibroids in the body of the womb. One of these was pedunculated, but the others seemed to be interstitial. The largest fibroid was in the fundus.

¹ Presented at the nineteenth annual meeting of the American Association of Obstetricians and Gynecologists, held at Cincinnati, September 20-22, 1906.

My first impulse was to let nature take her course, and to be prepared for operative intervention in case of necessity. On thinking the matter over, however, and calling to mind as they occurred to me a considerable number of cases with which I had been connected during my professional experience, I was led to doubt the advisability of delay. I accordingly wrote for advice to a considerable number of leading obstetricians. The replies that I received were as a rule rather positive, but the writers were about evenly divided in advising delay or intervention. (I was rather surprised to find three Chicago professors in favor of waiting, while slow Philadelphia gave a similar number who advised Cesarean section.)

Incidentally talking with some of the leading physicians of Columbus, I found that Dr. Loving could recall four or five cases, in two of which there was alarming post-partum hemorrhage, but both recovered. (I made a hysterectomy in one of these cases later, the patient recovering.) Dr. Rankin could recall one case of rupture of the uterus, the mother died, the child lived: one of post-partum hemorrhage, mother died, child lived: one of grave post-partum infection, but not fatal; one case of premature labor, with death of child, the mother living. Dr. Dunham had had three cases in his own practice. All of the children were born dead, and two of the mothers died of post-partum hemorrhage. He had seen two cases in consultation; in one the mother died of post-partum hemorrhage, the other died of ruptured uterus.

In my own field of observation I could recall three cases of rupture of the uterus, with three maternal and three fetal deaths. (No operation attempted.) Also (1) a hysterectomy for the removal of a large fibroid, with retained placenta above it, the fetus having been stillborn, and the mother septic. The mother recovered. (2) A hysterectomy for puerperal sepsis from necrosis of a large fibroid, temperature 105°. Patient recovered. (3) Two hysterectomies for dead fetus, with impacted fibroids. Both patients recovered. On the other hand, I had made nine Cesarean sections (one a Porro), without either maternal or fetal mortality.

Accordingly, after talking the matter over very freely with Dr. Kahn, and subsequently with the patient and her husband, the decision was promptly and unanimously in favor of Cesarean section.

The patient entered Grant Hospital March 31, our plan being to operate April 7. April 3 I made a vaginal examination, and this satisfied me that labor was immediately imminent, and we changed the date for operation to the 5th. This was fortunate, as labor really set in the latter part of the night of the 4th, so that by morning the cervix was amply dilated for drainage.

The operation was made in the usual way, in the presence of the family physician, and others. Instead, however, of finding a single child present, we found twins, male and female. Owing to the tenderness of the patient's abdomen, no very careful examination of the uterine contents had been possible. Both children were quickly delivered, and both cried lustily. Both placentas were removed, and some gauze thrust down through the cervix into the vagina, partly to absorb any oozing, and partly to cleanse the canal from above down. A supravaginal hysterectomy was then made in the usual way, saving one ovary. Chromicized catgut was used for bringing the cervical flaps together, both round ligaments being implanted between the flaps, so as thoroughly to support the cervix and vagina. The appendix was found somewhat diseased and was removed; gall-bladder found normal. As the recti muscles were quite widely separated, and the abdominal walls greatly relaxed, the incision was closed with catgut in layers, with pretty wide overlapping of the fascia of the external oblique.

Examination of the specimen corroborated what had been previously determined. The main fibroid was at the fundus, and had a very thin layer of uterine tissue between it and the peritoneum, and a similarly thin layer between it and the mucous membrane. Whether this weak point would have resisted the strain necessary to delivery is a matter purely of conjecture.

The mother made a prompt recovery, and with her two babies left the hospital one month after the operation. All three are at this time alive and well.

There are three special dangers to which the mother is exposed in all cases of fibroids complicating pregnancy, unless the fibroids are so small as to be negligible. First, rupture of the uterus. This rupture may take place in a healthy portion of uterine tissue and be the result simply of the mechanical

obstruction offered by the fibroid acting as an obstacle to the advance of the child, or the rupture may commence at the site of the fibroid as the result of the thinning of the uterine tissues at that point. Second, post-partum hemorrhage from inability of the uterus to properly contract. Third, post-partum sepsis from necrosis of the fibroids, from insufficient supply of blood. If the mother survives these three dangers she still, in the majority of cases, has her fibroids with her as a continued menace, and probably requiring operative intervention later.

Cesarean section, followed by hysterectomy, presents practically only the dangers of an ordinary hysterectomy. There is probably a slight additional risk from the increased vascularity of the tissues, but there are present only the usual sources of blood supply and the control of these by ligature renders the vascularity of the tissues unimportant.

While the average mortality of Cesarean section during recent years is usually placed at 10 per cent., it is well known that a good many operators have operated on large numbers of cases with a mortality very much less than this. (I have had eleven without any mortality whatever.) A large part of the mortality is clearly due to delay in performing the operation. The patient being more or less exhausted by the long labor is not in good condition to withstand the shock of the operation or to resist infection. Cesarean section, with or without hysterectomy, made by a good operator, and with good hospital surroundings, should give a maternal mortality of not to exceed 5 per cent., and a fetal mortality too small for consideration.

The patient is prepared as for any other operation; the operator can virtually select his own time, and he has his assistants and surroundings in accordance with his own ideas. If noninterference is decided upon, he may be called upon at a moment's notice to make a section for ruptured uterus, or, and usually with futile results, to check a frightful post-partum hemorrhage, or, finally, he may be obliged to make a hysterectomy, when his patient is profoundly septic, for the removal of necrotic fibroids. Cesarean section is prompt, positive, and curative, and attended with a very small mortality. Delay is uncertain and has a maternal mortality of 37 per cent., according to Rosenwasser, and a fetal mortality undoubtedly much larger than this. As between the two

procedures, therefore, as between action on the one side and inaction on the other, it seems to me there can be no question as to choice.

UTERINE FIBROIDS COMPLICATING PREGNANCY.¹

BY

MARCUS ROSENWASSER, M.D.,

Cleveland.

THE older statistics, on which were based the indications for intervention in pregnancy complicated by fibroids, will always have a historic value, but they have become unreliable in view of the rapid strides of modern surgery. Statistics gathered from recent experience are still insufficient, hence each additional case placed on record serves its purpose in establishing a better and safer management of this grave complication.

The necessity for such additional records is emphasized in the face of a report just published by Esch from Olshausen's clinic ("Therapie des durch myoma uteri bedingten Geburtshindernisses," *Zentralbl. f. Gynä.*, Vol. XXX., 17, 1906), of which the following summary is condensed from the July number of *Surgery, Gynecology and Obstetrics.*, pp. 185-186:

CASE I.—The subserous myoma filled the greater part of the true pelvis and the pouch of Douglas. It was a foot presentation. After a labor lasting two days, the membranes having ruptured, the tumor had risen, rendering delivery possible. The baby succumbed on the sixth day to injuries sustained at birth, and the puerperium was complicated by thrombophlebitis with pulmonary embolism on the part of the mother.

CASE II.—Eighteen months later the same mother was at term. The child presented by the occiput. By this time the pelvis was entirely occupied by the tumor. After three days of labor without results, a classical Cesarean section was performed. At the same time the myoma was removed from the posterior uterine wall. On the twenty-first day both mother and child were discharged in good condition.

CASE III.—The pelvis being filled by subserous immovable myoma and labor having continued for twenty-four hours with-

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out results, Cesarean section with supravaginal amputation of the uterus was done. The child was saved and the mother made an uneventful recovery.

Comment on these cases is almost superfluous. In the first, the child died from injuries sustained at birth, and the mother barely escaped death from a dangerous complication. In the second, valuable time was lost from unnecessary delay, though fortunately without harm. The third case confirms the present trend of thought, to operate early in order to insure the best results.

With these preliminary remarks, I wish to report the following case of

PORRO-CESAREAN SECTION FOR FIBROIDS COMPLICATING PREGNANCY, SAVING MOTHER AND CHILD.

Through the courtesy of Dr. R. E. Skeel the patient was left in charge of Dr. F. S. Clark and myself. We examined her at my office on June 11 and July 23, 1906. Her age was 28; she had been married three years, and was a primipara. She had always enjoyed good health; her menses were regular until November 17, 1905; she had not menstruated since. Two weeks after she had missed her first period she consulted Dr. Skeel to ascertain whether she was pregnant. The doctor confirmed the pregnancy, but found a hard, nodular tumor of the size of a hen's egg at the junction of the cervix and lower uterine segment. The tumor grew so rapidly after the third month that it would probably constitute an obstruction to delivery at term. At the time of our examination she was about six months pregnant. We found a hard, immovable tumor of the size of an infant's head, located at the junction of the cervix and the lower uterine segment in the right half of the pelvis, obstructing the greater part of the pelvic entrance and the hollow of the sacrum. The fetal head could be felt above the brim. At the second examination in July, the only change noted was a slight enlargement and a softening of the tumor. The patient was in excellent physical and mental condition, though she had been advised of the probability of an operation. For years she had been subject to "hay fever," which recurred regularly on August 8. According to Dr. Clark's computation, her term would end about September 5. We decided to await the beginning of labor before intervention.

On the evening of August 8 the waters broke spontaneously; there were no pains. The patient was removed to St. Vincent's Hospital early in the morning of August 9. The examination revealed the cervix an inch in length, patulous, and protruding from it a three-inch loop of pulsating cord. The tumor now occupied the entire pelvic entrance, resembling a presenting head. There were occasional slight pains. To save the child, immediate operation was decided on.

Operation.—The section, under ether, was performed in the presence of Drs. N. Stone Scott, W. H. Humiston, J. E. Cook, and others; the house staff acted as assistants. Dr. F. S. Clark took full charge of the child at and after delivery. The incision, from midway between the ensiform cartilage and the umbilicus to the pubes, was about ten inches long. After packing gauze all around, the anterior uterine wall was incised from fundus to bladder attachment. Hemorrhage was not violent and was easily controlled by a few clamps. There was no amniotic fluid nor visible membrane; the back of the fetus came first into view, covered with a thick coat of *vernix caseosa*. Grasped with both hands around its sides, the child was lifted out of the uterus without difficulty and passed to Dr. Clark after the cord had been clamped and cut. The placenta presenting in the uterine incision was next removed without appreciable loss of blood. The balance of the operation consisted in the usual supra-vaginal amputation of the uterus for fibroids, attaching the broad ligaments to the cervical stump and covering all raw surfaces with peritoneum. The ovaries were found healthy and not removed. The abdominal incision was closed in two layers; the peritoneum, together with the transversalis fascia with catgut, and the remaining layers by alternate through and figure-of-eight silkworm gut sutures, the latter passing through skin and fascia only.

The tumor was a subperitoneal myofibroma, situated in the lower right segment of the uterus, occupying the posterior wall. There were several small intramural and subperitoneal fibroids scattered in the body of the uterus.

Excepting a mild rise of temperature during the second week, with a moderate exudate about the stumps and in Douglas's pouch, convalescence proceeded normally until the patient was about to be discharged at the end of the fourth week. At this time she was taken with sharp pain in the left groin, which

gradually extended down the limb, with an almost imperceptible edema and an evening rise of temperature of 1° . A few days of additional rest with the foot of the bed elevated and the limb bandaged, sufficed to dispose of a very light phlebitis. She left the hospital at the end of the fifth week entirely recovered. The "hay fever" made its appearance about a week after the operation, but was so slight that it did not constitute a complication.

The baby was asphyxiated at birth and required a prolonged effort at resuscitation. It weighed five pounds, was fairly well developed, but was not strong enough to take the breast. It had, however, gained two pounds before leaving the hospital.

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DISCUSSION.

DR. E. GUSTAV ZINKE, of Cincinnati, in opening the discussion on these papers, said it was doubtful whether any obstetrician of reputation would not have acted in cases of this kind as the essayists had done. That intramural fibroid tumors, which probably escaped diagnosis, and were not recognized very often during the progress of pregnancy, would not complicate pregnancy, there could be no doubt. He had delivered two women in whom a tumor was discovered after they were delivered, but not before. These tumors were intramural, very small in size; one the size of a walnut, and the other the size of a hen's egg. They were more or less flattened, but they did not constitute an elevation upon the anterior surface of the uterus upon which they were situated.

It was different, however, when we dealt with interstitial uterine fibroids, which implicated the uterine wall. The first case he saw was one of this character. The patient had been in the hands of a midwife, and when she had failed to deliver the woman, Dr. Taylor was called in to assist. This case happened twelve years ago. Dr. Taylor made an examination and felt a foot presentation. When he came upon the scene the membranes had already ruptured, and an effort was made to bring down one foot and to deliver, but this failed. He asked another gentleman in the neighborhood, who had a considerable reputation as an obstetrician, to see the case, and when he came to the patient he likewise made an effort to deliver by pulling down the feet. He failed, and the real nature of the case had not been recognized at the time. Finally, Dr. Zinke was called. On examination he noticed the cervix was very thin, only an inch in diameter, and it was impossible to insinuate his finger or hand between the prolapsed leg and the uterus. He could not hear the fetal heart. There was no evidence of fetal move-

ment. The woman was in a very bad condition, and it was simply a question as to whether she should be permitted to die undelivered or whether a Cesarean section should be done. This was in a private home, and the woman was next to her dining-room, in bed. The kitchen table was improvised as an operating table, and the speaker made a Cesarean section as hurriedly as the circumstances would permit, getting the aseptic dressings from the hospital. The instruments were sterilized; also the abdomen of the patient. He opened the abdomen; the uterus was large; the woman had reached full term; and, he found that the inner wall measured one inch in thickness. He delivered a dead fetus; and the woman died within forty-eight hours from sepsis.

This case made a serious impression upon him, not only at that time, but as regards subsequent developments. While at the present time he did not think we could take a different stand in regard to this subject than the one that Drs. Baldwin and Rosenwasser had taken, he believed that if an early diagnosis of fibroid tumor was made, even where the pregnancy was far advanced, it should be considered an extreme source of danger to the woman, especially if it was subperitoneal. He did not think there were cases of pregnancy complicated with submucous fibroids. He had never seen or read of one; but in the intramural and the subperitoneal varieties, pregnancy not infrequently accompanied them, and he thought Cesarean section gave the mother and child the best chance for life, particularly if she were taken to a place where the operation could be performed under aseptic conditions, and when it was performed by one who was familiar with the technic of the operation.

So far as the removal of the uterus was concerned after Cesarean section, he regarded it as the easiest hysterectomy imaginable; it did not prolong the operation very materially; it did not add to its dangers, and he really could not understand why there should be any objection on the part of anyone to the performance of this operation under the circumstances described.

DR. OSCAR H. ELBRECHT, of St. Louis, said that within the last year he had had about fifty operations, and in one of these there was a fibroid complicating pregnancy at the fourth month. This tumor was subperitoneal and situated in the posterior uterine wall. He removed it, sewed up the wound, and the woman went on to full term.

He had seen five cases of fibroid tumors of the uterus in which the woman went on to full term. These tumors were situated either in the posterior or anterior wall, or fundus, and gave absolutely no trouble. He thought they were subperitoneal. In fact, they were not discovered until after the women were delivered. This forced him to conclude that in many of the cases operated on the fibroids would have proven absolutely

harmless. If there was a small subperitoneal fibroid, there might not be any occasion to operate for its removal. He had seen one case in which a large fibroid obstructed the pelvis. The cervix was pulled up, while the vagina was pulled forward, and the pressure on the rectum was so great that the patient could not have a bowel movement unless she received an enema and was given plenty of salts, from above. Cesarean section was done in this case with a perfect result. The distinction he had made was that if he had a small fibroid to deal with, one say the size of a hazelnut, or walnut, and it was subperitoneal, he believed that the woman would go on to full term and be delivered without any trouble. He had yet to see a fibroid of that class that had given any trouble. He had also removed a pus tube during the fifth month of pregnancy without any trouble. All cases of interstitial fibroids that could be diagnosed accurately should be operated on on account of the danger of rupture of the uterus. He had seen one case in which the uterus was ruptured as a result of the presence of such a fibroid. If the fibroids were small they could be removed and the uterus left. He had also removed gallstones and a hydronephrotic kidney within the last three months; the women went on to term, and were delivered without any trouble.

DR. ROBERT T. MORRIS, of New York City, said that in one case he operated for the removal of a subperitoneal fibroid at the fifth month of pregnancy. The patient was having miscarriage pains about once in fifteen minutes. He operated with a desperate chance of trying to save the child. The woman was nearly fifty years of age, and this was her only pregnancy, and a good deal depended on the birth of a child in the family. The so-called labor pains ceased, after he had removed a fibroid about as large as his fist; she went on to full term, and was delivered of a living child.

DR. JOSEPH PRICE asked whether the tumor was in the pelvis.

DR. MORRIS replied that it was outside the pelvis and could be plainly felt through the abdominal wall.

DR. JOSEPH PRICE, of Philadelphia, said the authors of these papers had overlooked much valuable literature on the subject that could be found in the Transactions of the Association, together with remarks on the exhibition of beautiful specimens. In previous years, in the history of the Association, cases of interstitial and subperitoneal fibroids had been reported as complicating pregnancy, some of the tumors being large enough to fill the birth passages. Some of these tumors were pedunculated. Fibroid tumors complicating pregnancy were at present quite common. He listened to a valuable contribution a short time ago in Pittsburg on the subject of fibroids and monstrosities complicating labors. The patients in three or four instances, after trying, tedious deliveries, were all saved. The children were sacrificed. He thought the children were dead

before they were delivered. One of the labors was not only complicated by a dead monstrosity, but by multilocular fibroids. This obstetrician succeeded in delivering a large monster without a single accident or complication following a normal delivery of that character. When recognized early and falling into the hands of skilful operators, patients with pedunculated fibroids could be operated on safely, and allowed to go to full term, without premature delivery or abortion. He had said on previous occasions, and he did not hesitate to say so again, that a pedunculated fibroid complicating advanced pregnancy could be removed through a vaginal incision. He had operated on a good group of these cases. It was important in several instances to save the child. In most of them he had found an error had been made in diagnosis; that fibroids complicated the birth passage, with a dead child above. He would not hesitate to do a Porro-Cesarean section in a case in which he thought it was indicated. If one did the old Porro operation, he could save all patients; but by the modern method of doing it the patients were not all saved. One gentleman had reported nine Cesarean sections, with closure of the incision by catgut, with three of the patients bleeding to death. If he were to do nine supravaginal extraperitoneal Porros to-day, it would not deter him from eating three good meals a day, because these patients when operated by that method got well. He never knew of but one or two patients who had undergone supravaginal extraperitoneal hysterectomies that died. He had forgotten whether the labor was complicated by fibroid tumors or by a deformity, but Elliott Richardson did the first Porro operation that was done in this country. It was shortly after Porro reported his work. Richardson saved both mother and child. He did this Porro operation by the elastic ligature method and darning needle and pins.

DR. ZINKE wanted it distinctly and thoroughly understood that he did not advocate Cesarean section for anything that did not give a patient any trouble. The woman he had referred to in his previous remarks was septic at the time he saw her; the preparations for the operation were hurried; the surroundings of the patient were of such a character as to be unfavorable for her to undergo a prolonged operation. If he had made a Porro operation under the circumstances, it would not have been an easy one. Besides, the case occurred twelve years ago, when he was not so familiar with the subject, and he thought the patient would have died before he finished the operation.

DR. EDWARD J. ILL, of Newark, New Jersey, did not think the impression should go out from the Association that every woman who had fibroids ought to have her uterus removed or a Cesarean section done. The indications should be drawn closely. If there was obstruction to labor, then operation

was indicated. But again and again he had looked for an obstruction; he knew fibroids were present, and then he always remembered what his friend and teacher (Bandl) told him about—namely, the retraction of the cervix. Within a few days before labor the cervix would retract, and labor would go on without difficulty. Of all the cases he had seen—he did not recall how many—he had had only one chance to do a Cesarean section for fibroids. He certainly thought that the extraperitoneal Porro had an excellent place in surgery. It must be the exception, however, where it should be done. In those cases in which an effort had been made to effect delivery for hours, cases of extraperitoneal fibroids, one would not dare open the uterus and let the fluid contents escape into the peritoneal cavity; but would bring the uterus out, apply a ligature, or the *serre nœud*, and sew up the peritonæum before the uterus was cut off, and the woman would get well.

DR. FREDERICK BLUME understood Dr. Ill to say that he would sew up the peritonæum before he opened the uterus.

DR. ILL replied, yes; after the removal of the fibroids from the pregnant uterus, it was perfectly feasible if one cut the uterine tissue. He had removed a fibroid, which weighed sixteen pounds, because of the severe pain it caused, closed the incision with continuous deep and superficial sutures, and the woman got well and went to full term. This case showed that there was a chance for conservative surgery in connection with fibroids complicating pregnancy. But surgery, in his judgment, was a rare thing for fibroids complicating pregnancy.

DR. FREDERICK BLUME, of Pittsburg, said, in regard to the case mentioned by Dr. Price, that the operation was done by his assistant in a very careful manner. He (Dr. Blume) operated on the patient afterward for the removal of a fibroid tumor, doing a supravaginal hysterectomy. This case showed that even in complicated cases delivery was possible without harm to the patient, if effected in a skilful way.

With regard to Porro-Cesarean section, he was glad to hear Dr. Ill and Dr. Price recommend the original Porro operation. He gave it up twelve years ago. It was the last operation he did for removal of a pelvic tumor complicating pregnancy at term. He reported the case to the Pennsylvania State Medical Society, and was severely criticised by Philadelphia surgeons. It was at a time when very little was said about supravaginal hysterectomy. He was positive that if a surgeon had a suitable case and did the old Porro operation, it could be done much more rapidly.

With reference to pelvic tumors, fibroid tumors, or ovarian tumors complicating pregnancy, any tumor which obstructed the pelvis ought to be removed. About a year ago a woman consulted him for an examination. She was pregnant about three months. He found a large tumor situated about an

inch above the umbilicus. It was a fluctuating tumor, and was about the size of a three months' pregnancy. He thought it was an ovarian cyst complicating pregnancy. He operated on her, and when he opened the tumor it did not appear like an ovarian cyst, but looked like the uterus. He enlarged the incision and found it was the uterus of a seven months' pregnant woman, and the other growth was a fibroid tumor projecting into the pelvis. The incision was closed, and he said if the woman recovered and the child was viable he would operate. He could not remove the tumor very well because it was impacted or adherent to the uterine wall, and to have removed it would have destroyed pregnancy. The woman insisted on being delivered without any operation. The speaker took charge of the case, and delivered a nine-pound child, but likewise took the liberty of removing the uterus. The woman was forty-five years of age. The presentation was a breech one. The child was dead. The woman, however, did well. This case showed that fibroid tumors do not disappear after labor. In six months the tumor grew to such an extent as to inconvenience her materially, and he did a supravaginal hysterectomy.

Like Drs. Price and Ill, he would not like the impression to go out that every woman who had a fibroid complicating pregnancy should undergo Cesarean section. There were not many surgeons or obstetricians who considered a Porro-Cesarean section an easy thing to do. Furthermore, he thought the mortality in this country from that operation was over 50 per cent.

DR. HUGO O. PANTZER, of Indianapolis, Indiana, had had eight cases of fibroid tumors complicating pregnancy. Three of them had a bearing on the question of the indications for operation. The first of these he was called to see after the expiration of ten days. The woman had given birth to a living child; she had developed fever, and at that time was passing a fibroid which had become gangrenous, he would say, in contradistinction to septic. Perhaps it was a difficult matter to decide that point.

He cited a case to controvert the view expressed by Dr. Zinke, who had said that there was no such thing as a submucous fibroid. This certainly would give clinical evidence of such a case. The second case he was called upon to deliver after the woman had been in labor some forty-eight hours. A large tumor was found at the time, located in the fundus. Within four days this tumor sloughed away.

To return for a moment to the former case, the sloughing fibroid was removed by forceps; the patient made a good recovery, and had since become pregnant again.

In the second case, on the third day after delivery, the tumor gave evidence of sloughing, and within twenty-four

hours he operated per vaginam, and the woman made a good recovery.

The third case pertained to a woman, 42 years of age, who became pregnant for the first time, and who at the fifth month of pregnancy gave evidence of chronic nephritis. She had a tumor which was located posteriorly at about the height of the internal os, which obstructed the birth passage. There was a great desire to have a living child. He had her under observation at the hospital, where at any moment he could run in and see how she was getting along. She was operated at the time when labor was impending by a simple Cesarean section. The operation, although done expeditiously, yielded an unsatisfactory result. The child was born alive—was living to-day, he believed—while the mother lived until the eighth day, when death occurred from urinary suppression.

DR. JOSEPH PRICE, of Philadelphia, had seen a few cases of intrauterine sloughing fibroids early in his obstetrical experience, which were recognized in delivering the placenta by the Cr  d   method. These tumors were small. It was known that we had the interstitial, the submucous, and the extra-peritoneal varieties of fibroids to deal with. He recognized those fibroids, and the women were scared of their retention, but where a second pregnancy followed he had noticed that the fibroids commonly disappeared. Early in his professional life he urged these women to complete the cycle of reproduction and conceive.

Speaking about sloughing fibroids, he said that an old nurse and a very valuable one, from Vienna, Ohio, married at the age of thirty, and was subsequently delivered of a fine boy. He saw her only a few days ago. She was delivered by Dr. Hayes (now dead), and a violent sepsis followed. Dr. Hayes wrote him about her. She married late in life. He explored the cavity of the uterus and found a sloughing fibroid projecting from the mucous coat. This tumor was removed. She made a slow and tedious recovery, but had not conceived since. These were terrible cases, and many of them died of sepsis, without the attending physician having a solution for their precise nature. If physicians made careful intrauterine examinations in these cases, undoubtedly they would find the cause. Cases of sloughing fibroids were not uncommon.

DR. J. HENRY CARSTENS, of Detroit, said that the cases under discussion varied so much that surgeons could not lay down any general rules. Fibroid tumors were often detected when women were pregnant. If a small fibroid was found in the cervix, it could be removed per vaginam, sometimes when the woman was pregnant, thus saving her a severe labor. Sometimes, however, the fibroid was large, was situated higher up, and she might only have one tumor in the broad ligament that would interfere with labor; she could be operated on, whether

she had advanced three or six months in pregnancy, and saved future trouble. With a woman in labor who had fibroids, no definite rule of conduct could be laid down. If the uterus contained several fibroids, and there was reason to suspect that there were a number of little ones, it was better to do an abdominal or supravaginal hysterectomy. If one was required to do a Cesarean section for a large fibroid of the uterus, it seemed to him that the fibroid ought to be removed and an attempt made to save the uterus. He used to be a strong advocate of the Porro operation. If a woman had been in labor for three or four days, who had been handled by all kinds of people, who was probably septic or would be so, and who would probably die if her uterus was left, her life might be saved by removing the uterus. He never did a Cesarean section except in such a case as he was going to relate.

He recalled the case of a woman whom physicians attempted to deliver by craniotomy. She had had three or four difficult labors, and finally became pregnant again. Three different physicians saw this woman, and for forty-eight hours the woman had been worked at in all kinds of ways. They tried to perform craniotomy, but could not do so successfully. They sent for the speaker, who telephoned to have the woman brought to the hospital, where he delivered her by means of a Cesarean section. He was sure that this woman would have died if he had not removed the uterus. When a woman said to him, "Doctor, if you will only save my uterus, so that I can have another child," that expression came back to him when he did a Cesarean section, whether it was the right thing to remove the uterus or not, and so he was inclined to remove fewer and fewer uteri, especially if the women were young and had had no children, or the first child was dead. He tried to save the uterus and to give such a woman one more chance to become a mother.

DR. BALDWIN, in closing the discussion, on his part said he had never felt very kindly disposed toward myomectomy during pregnancy. He had never found a case in which it seemed to him advisable. If he had a case in which a subperitoneal fibroid complicated pregnancy, unless the tumor was very low down, he would expect the woman to go on to term without that tumor producing any harm. It was not necessarily the size of the tumor that caused trouble. In one case which he reported, in which death occurred from rupture of the uterus, and which he saw at autopsy, the fibroid was single. It was small; but there was a thinning of the uterine wall inside and out, and rupture started at that point, with a fatal result. Many of the fibroids which were seen in connection with pregnancy were so small or were so situated that they might be regarded as negligible. In other words, the surgeon need not pay any attention to them, as they were so small. The women

would be able to get along all right, and after they had been delivered we might not be able to find any fibroids. The danger of necrotic fibroids was something we could not anticipate; it might come with a small tumor; it might come with a large one. He would be inclined to respect any subperitoneal fibroids rather than interstitial, where the blood supply would be better.

One of the speakers had referred to the point that submucous fibroids were a hindrance to pregnancy. Dr. Tate reported last year several cases of fibroids in which pregnancy had taken place. They were submucous fibroids. If the subperitoneal fibroid was low down, so that we could hardly anticipate whether it would rise above the pelvis during the latter months of pregnancy or not, then a myomectomy would be the choice of operation, making it carefully so as to keep as far away from the uterus as possible, and not handle the uterus, if possible. He had done two ovariectomies during pregnancy, and in so doing handled the uterus very little indeed. In one case he made a double ovariectomy in a woman who was three months pregnant. Her abdomen was filled with three large tumors. He was not as careful as he ought to have been, and left a little ovarian tissue outside of his ligature, and the woman had three children afterwards.

The point in his paper was, that we should not wait. These cases should be seen by a surgeon. If the tumors were so situated and were so small that they might be neglected, well and good; but if they were so situated, were subperitoneal and gave trouble, they should be removed by myomectomy, or Cesarean section, with hysterectomy, which would be a wise procedure. But if interstitial, and of such size that the uterine muscle on the outside and inside of it between the peritoneum and mucous membrane was involved, as in the case of rupture of the uterus, he reported, it seemed to him Cesarean section with hysterectomy was the safest procedure to undertake.

DR. ROSENWASSER, in closing the discussion, said that the criticisms that had been made did not apply to him. In his argument he referred to eight cases he published to add to what he had already written on this subject, and he wished to say that in the discussion of 1896 and 1897, the indications, so far as they could be laid down, were thoroughly reviewed, and it was pretty well agreed that each case was a law unto itself. We could not lay down any indication for operation or noninterference except the case itself be thoroughly followed up and the indications placed under such circumstances. We had not advanced any further to-day than we had at that time.

In addition to the three dangers Dr. Baldwin had enumerated in his paper, in these cases of uterine fibroids complicating pregnancy, there was an additional danger that had not been mentioned, which he came across and mentioned in his paper,

published in 1899—namely, a case in which the uterine fibroid projected into the cavity of the uterus. It was not submucous, but interstitial. The obstetrician at the time delivered the woman safely, but she developed sepsis. He was called to see her five days after delivery, and found her deeply septic. The entire placenta was retained above the fibroid, projecting into the uterus. It was not accessible. He did a hysterectomy, as he could not get at the placenta, and the woman died of sepsis in twenty-four hours. There was the additional danger in these fibroid cases that after the child had been delivered safely we might have a sloughing fibroid and retained placenta, not perceptible, undergoing sepsis.

ABDOMINAL SECTION FOR TRAUMA OF THE UTERUS.*

BY

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Puncture of the nonpuerperal uterus, with prolapse of bowel; violent seizure and tearing away of sixteen inches of gut; immediate abdominal section, repair of uterine lacerations; intestinal anastomosis; recovery.

In presenting this subject for consideration I will offer the brief history of a recent case upon which I operated.

Mrs. L., aged 39 years, mother of two children; the older 2 years, the younger 5 months, entered the City Hospital April 7, 1906.

She had been suffering from vague abdominal pain and discomfort for some months prior to her last pregnancy, more marked since the birth of the last child.

Her physician, thinking it probable that she was suffering from an endometritis or possibly from some retained secundines, but more particularly in the line of diagnosis, had given her an anesthetic, dilated the uterus and curetted. Believing that he felt some growth foreign to the uterine cavity he attempted its removal by the use of the placental forceps. He grasped the growth, made traction, and twisted. When it gave way and was removed he discovered that he had 40.5 cm. of small intestine. Fully realizing the seriousness of the situation he brought

* Presented at the nineteenth annual meeting of the American Association of Obstetricians and Gynecologists, held at Cincinnati, September 20-22, 1906.

her immediately to the hospital. Her condition on arrival was one of shock, temperature subnormal, pulse 140.

On opening the abdomen, which was done immediately, through a median incision 11 cm. long, blood gushed out and it was found that the entire abdominal cavity, including the pelvis, was filled with it.

That the hemorrhage was recent was evident from the fact that little clotted blood was found. There were two lacerations of the uterus; one through the fundus extending from tube to tube, the second through the uterus and broad ligament on the left side. These lacerations were bleeding freely. Their surfaces were at once brought together with catgut sutures, which completely checked the hemorrhage from those parts.

Next it was found that 40.5 cm. of the ileum was missing (which corroborated the doctor's statement) beginning at the ileocecal valve and extending upward. Hemorrhage from the mesentery had ceased, in spite of the laceration of large vessels. The mesentery was ligated with heavy silk and trimmed; the ileum also was trimmed and the opening at the ileocecal valve was closed because it was so lacerated and contused as to render it inadvisable to form the anastomosis at that point. An opening was made farther up in the cecum and the ileum connected to it with a Murphy button.

The abdomen was flushed, dried, and closed without drainage. The subsequent history of the case can be briefly stated by saying that she made an apyretic recovery, the button passing on the thirty-first day, and the patient going home in five weeks in perfect health.

The cases in literature may be classified as follows:

A. Early Cases at or Near Term Before the Era of Abdominal Operation or of Unusual Operative Interference by Instruments, Within the Uterus.—The numbers refer to the cases as listed in the bibliography.

1. Baudeloque. No details. Death.
2. M'Reever. Spontaneous rupture during labor, 122 cm. intestine, fecal fistula, recovery and subsequent pregnancy, normal labor.
20. Robiquet. Spontaneous rupture during labor, forceps extraction, small intestines and omentum, reposition immediately, interrupted by uterine contraction, again on second day. Recovery.
21. Radcliffe Wood. Seventh month, putrid fetus, spontaneous rupture. Recovery.
22. Currie. Breech presentation, spontaneous rupture, recovery.

23. Murphy. Term, spontaneous rupture, child delivered by forceps from abdomen. Death from intercurrent affection.
24. Birch. Same version, perforation of cranium. Recovery.
25. Collins. Same.
26. Hooper. Same, rupture after ergot, fetus extracted by hook from abdomen. Death.
27. Trask. Seventh month, shoulder presentation, version. Recovery and subsequent delivery.
28. Trask. Similar.
29. Trask. Quoted from Duncan, term, spontaneous rupture, child and placenta extracted from abdomen. Recovery.
30. Monroe. Same.
31. Percy. Same, arm presentation. Death, bowel strangulation in uterine rent.
32. Smellie. Same.
33. Amussat. Same, sigmoid in uterus.
34. Holmstead. Term, contracted pelvis (4-para), version and perforation. Death.
35. Dubois. Same (8-para). Recovery
36. Bedford. Same. Death.
37. Collins. Primipara, spontaneous rupture, delivery by version from abdomen. Death after twenty-five days.

Not enough data are given to determine the relative predisposition of primipara and multipara nor of early or advanced age. It may be said, however, that neither opposed condition offers immunity. Of the twenty foregoing cases, twelve recovered, with subsequent successful delivery specified in two. Although allowance must be made for reluctance to report unsuccessful cases, it may be said that, at present, there is considerable argument for reposition of the prolapsed bowel under aseptic precautions, provided that the uterus closes firmly, that there is not severe hemorrhage, and that no great degree of force has been applied to the bowel. This is especially true in view of the depressed condition of the patient after uterine rupture. It is not always possible to distinguish between spontaneous and traumatic rupture, nor does the former exculpate nor the latter incriminate the accoucheur. In many cases, spontaneous rupture implies neglect of the patient during a difficult labor and, conversely, during the application of forceps, version or other obstetric operation. Abundantly indicated on general principles, for the safety of the patient, rupture of the uterus may occur independently of the operation itself or may be an inevitable result of the most careful procedure. By conceding that after a rupture during labor, it may be wise to re-

posit the prolapsed bowel without opening the abdomen, it is by no means intended to imply an indorsement of a "laissez faire" policy during the entire labor, such as was generally indicated before the development of modern surgical methods. On the contrary, in cases in which rupture of the uterus is imminent, Cesarean section is plainly indicated before the labor has been protracted so far, at least, as to render intrauterine manipulation difficult and dangerous, and to reduce the patient's strength to a minimum.

B. Cases at or Near Term, with Operative Interference.—

3. Coe. Multipara, version and forceps. Immediate reposition, next day resection of 122 cm. of gangrenous bowel and extirpation of uterus. Death same day.
15. Amann. 5-para, version rupturing uterus, extirpation of uterus, suture of torn cecal attachment, temporary vesicovaginal fistula. Recovery.
16. Ullman. 6-para, suture of uterus, resection of 250 cm. of small intestine. Death after two days.
17. Boldt. Similar, details not described, abdominal section after fifty hours, ileum separated from mesentery for 14 cm. and gangrenous. Death.
38. Bedford. 3-para, delivery via abdominal incision, uterus sutured. Recovery.
39. Pusch. 13-para, rachitic pelvis, labor induced three weeks before term, version ineffectual, forceps tore off fetal head, next day resection of 2 m. of small intestine. Death same day.
55. Stewart. 6-para, omentum and uterus extirpated. Recovery.
58. Girvin. 5-para. Extirpation of uterus. Death from shock.
60. Fraser. 9-para. Hysterectomy. Recovery.
63. Kolomenkin. 7-para. Total hysterectomy. Recovery.
68. Seitz. Multipara. Porro. Death, shock.
71. Andr ws. Hysterectomy. Death, shock.
72. Pilcher. Rent stitched and drainage. Result not stated.
77. Fornari. 2-para. Supravaginal hysterectomy. Death.
79. Freund. 5-para. Abdominal section, no details. Death third day.
80. Freund. 4-para. Reposition by traction from above. Suture of rent. Death after three days, peritonitis.
82. Walcher. Hysterectomy. Drainage through vagina. Recovery.
84. Stajmer. 7-para. Abdominal section, extraperitoneal amputation of uterus. Drainage by vagina and preperitoneal space. Recovery.
86. Bacher. 3-para. Porro. Death from secondary hemorrhage.
87. Dietel. Resection of 65 cm. small intestine. Suture of tear. Death shock.

89. Frank. Primipara. Suture of uterovaginal tear, from below (?). Recovery.
90. Frank. 6-para. Transverse abdominal section, decapsulation of uterus. Recovery.
91. Everke. Suture of vagina. Recovery.
92. Everke. 6-para. Suture of uterine tear from below (?). Recovery.
95. Klien. 9-para. Abdominal section, suture of uterine tear through serosa only. Recovery.

C. Recent Cases, At or Near Term, Without Operation.

12. Mendel. 7-para. Seven months fetus, macerated, spontaneous rupture, reposition in spite of contact with bed, iodoform gauze tampon. Recovery.
13. Peham. 2-para. Justo-minor pelvis, reposition and tampon as above. Recovery, subsequent 7-months' induced labor, rupture of uterine scar, Porro operation.
14. Toth. 7-para. Spontaneous rupture and escape of fetus and placenta into abdomen, delivery by feet and umbilical cord, reposition and gauze tampon, peritonitis, abdominal abscess and hernia, drainage. Recovery in three months.
56. Hargrave. 10-para. Death before operation could be done.
61. Schmidt. 2-para. Immediate reposition and packing of lower uterine segment and vagina. Recovery.
62. Woods. 1-para. Reposition. Recovery.
64. Reumer. Evisceration of woman by intoxicated physician. Death.
66. Wirtz. 8-para. Death before operation could be done.
67. Mors. Intestine repositioned into vagina only, gangrene. Death.
69. Merz. 7-para. Reposition, rubber drain through tear. Death after nineteen days, peritonitis.
70. Merz. 4-para. Reposition and gauze packing. Recovery.
73. Schleisner. 5-para. Reposition. Recovery.
74. Schuchard. 3-para. Reposition, irrigation. Recovery implied.
75. Osterbind. 7-para. Reposition. Death after seven days, peritonitis.
76. J. D. Thomas. 9-para. Death from shock, after eight hours.
78. Freund. 9-para. Reposition and iodoform packing. Death after three days, peritonitis.
81. Rieinger. 2-para. Omentum repositioned, iodoform gauze packing. Recovery.
83. Cook. 4-para. Reposition and iodoform gauze packing. Death from shock after eight hours.
85. Schaffer. Reposition. Recovery.
86. Klien. 7-para. Reposition, iodoform gauze packing. Recovery with rectovaginal fistula.
93. Roberts. 10-para. Reposition of omentum and intestine, gauze packing. Recovery.
94. Hochstetter. 29 cm. intestine separated from mesentery. Death no details.
96. Burger. 4-para. Reposition. Ergotin. Recovery.

It is obviously difficult to outline any given treatment in such cases and it should be remembered that the reporters, whether they operated or not, were usually not the original attendants, and that they were often summoned late. There is an obvious general indication, especially on account of the liability of a uterine scar to rupture in a subsequent delivery, to prevent conception after such cases, and in many instances this is tantamount to stating that the uterus should be extirpated, with or without the adnexa, according to circumstances. In many instances, however, conditions analogous to those encountered in other abdominal lesions, render an interval operation preferable to an early operation in collapse, or to a delayed primary operation. Even after abdominal section, ideal operations are occasionally impossible. Aside from the obvious indication to extirpate the uterus, it is usually necessary to suture the rent, though, owing to the contraction of its fibers, there is seldom much hemorrhage from this source and the indication for suture is not so absolute as theoretically appears.

According to the degree of laceration of the intestine, minor repairs, resection, anastomosis, either end-to-end or by means of establishing patency around a more or less typically resected cecum, establishment of an artificial anus, temporary or permanent, must be practised. Even when large mesenteric vessels are divided, there may be surprisingly little hemorrhage, or a copious hemorrhage may cease spontaneously, as in the writer's case. The peritoneal toilet must be made in accordance with existing conditions. Even when there has been considerable hemorrhage or escape of fecal contents, flushing is liable to spread the infection and careful sponging and drainage may be preferable. Open treatment will at times be indicated. Unless there has been gross carelessness and continued mauling of the intestine, it will rarely if ever happen that enough intestine will be involved to interfere with its subsequent function. Indeed, unless an attendant has been not merely careless but grossly ignorant, or has been disturbed into a state of irresponsibility, he can scarcely persist in drawing down and mangling an amount of intestine that cannot be safely sacrificed. Secondary operations for adhesions, fistula, hernia, abscesses, etc., may be indicated, especially when the primary abdominal section has been performed under adverse circumstances.

It is with some hesitation that statistical comparison is made

between simple reposition and abdominal section; first, because it is not possible to determine absolutely as to the condition of the intestine, amount of infection, etc., in the abdomen and the retractibility of the uterus; and, second, because if this could be done, the cases to which simple reposition is appropriate would naturally have a better prognosis. However, of the 26 operative cases (three or four sutured through the vagina), 13 died, 12 recovered and the result of one was not stated. Of the 23 cases of reposition, 10 died and 13 recovered.

In the group of operative cases, there are 10 in which the intestine was, explicitly or implicitly, uninjured, but in which the abdomen was opened. Seven of these recovered. Of the non-operative cases, one, of nearly total evisceration, was obviously fatal: in one, the intestine was merely poked back into the vagina, while two others were hopeless without abdominal section, and died while preparations were being made for it. This leaves 19 cases with 13 recoveries, treated by reposition, the result being almost exactly equal to that after abdominal section. Three of the abdominal sections were required because reposition could not be effected from below; and, in one of these, badly inflamed intestine was left *in situ*, with doubtful propriety, death resulting. In three or four operative cases, suture was done from below, after reposition of the bowel, all recovering.

D. Cases Due to Curetment or Similar Operations Following Miscarriage, or to Gross Lesions in Inducing Abortion.

<i>No^m Efficient Treatment.</i>	<i>Reposition.</i>	<i>Operation.</i>	
		<i>Through Vagina.</i>	<i>Through Abdomen.</i>
			4. Noble. (Three ops.) Recovery.
			5. Alberti. Recovery.
	6. Veit.	Death.	Sepsis.
			7. Gusserow. Death, pulm. embolism.
			8. Orthmann. Recovery.
			9. Olshausen. Death, sepsis.
10. Martin.	Death.	(Patient moribund.)	
			11. Van Riper. Recovery.
			18. Ullmann. Recovery.
			40. Wilson. Death, fatty degeneration.
	41. Jarman.	Recovery.	

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| 42. Jarman. Recovery. | |
| 43. Dudley. Recovery. | |
| 44. Hessert. Recovery. | |
| 45. Hardie. No details. | 46. Boblanck. Recovery. |
| | 47. Ochsner. Recovery. |
| 48. Andrews. Death in an hour. | 49. Mann. Recovery. |
| | 50. Mann (quoted). Death, sepsis. |
| 51. Mann (quoted). Death. | 52. Van de Warker. Death, collapse. |
| | 53. Krusen. Recovery. |
| | 54. Hoffman. Recovery. |
| | 59. Fairchild. Death. |

The cases under the first subdivision should, of course, have been subjected to immediate operation as affording the only chance of recovery. It should be stated, however, that in so far as the reporters or consultants were concerned, there seems to have been ample cause for discouragement.

In cases which have been kept aseptic and in which the bowel has prolapsed through an opening made by a blunt instrument, as in criminal abortions or in which the operator has accidentally pulled down the bowel with the finger or by a blunt instrument, and when the bowel can reasonably be inferred or can be demonstrated to be intact, reposition alone may be justified. Still, notwithstanding the favorable outcome in the three cases reported, the uncertainties are usually so great as to contraindicate this procedure, except in cases at or near term.

Without reference to the general discussion regarding the advisability of the vaginal or abdominal route in surgery, cases of this nature require such careful inspection and the possibilities of inaccessible lesions are so great that the abdominal incision should almost invariably be preferred. Even cases seen late, with a fecal fistula, and apparently involving only the rectum, are not an exception. As shown in the fuller report of one of the cases at term, the enema test to determine the height of the lesion in the bowel is not reliable.

The majority of cases reported show that the general consensus of opinion is in favor of a careful scrutiny of the abdominal contents. Most of the abdominal sections resulted in resection, for the reason that most of the lesions were due to

involvement of the bowel in cureting the uterus. In a few of these cases, however, the bowel had, fortunately, escaped serious injury. On the other hand, in others the laceration was extreme. The physician who thought that he was simply eviscerating a three-months' fetus, instead of the mother; the consultant who insisted that the intestine was the umbilical cord; the several instances in which delivery of the intestine was persisted in, even after enough had come down to establish its identity; and the case in which, after pulling down 183 cm. of bowel, it was deliberately amputated, illustrate the extremes to which gross ignorance or desperation may lead. In case 64 there was almost complete evisceration, but the physician was intoxicated.

Van de Warker and others emphasize the danger of curetting the uterus. Yet, with all possible allowance for the concealment of cases, the number in which the intestine is brought down through the opening or drops into the uterus, is exceedingly small in comparison with the number of cases in which abortions are induced or are radically treated by physicians. The diminution of mortality by the policy of thorough evacuation of the uterus after induced abortion is great, the danger of lacerating the intestine very small. Yet, it must not be forgotten that the uterus after an abortion, especially when septic inflammation has already set in, is liable to be very fragile and that apparently careful exploration and instrumental removal of secundines, may cause perforation. Granting that the intestine prolapses through a rent, its further withdrawal or even its laceration, is almost inevitable and it is scarcely conceivable that any method of inspection, palpation, direct or instrumental, or other diagnostic means can determine this point or that any delicacy of manipulation of an instrument, efficient to clear the uterus of débris but insufficient to lacerate the bowel, or at least to jeopardize its connections, can be attained. This point is important, both from the medico-legal, the bibliographic and the practical standpoint.

Involvement of the intestine in instrumental abortion obviously renders the prognosis grave and predisposes to such catastrophies as lead to the indictment of the abortionist. In justifiable abortion, which should never be performed without council, unless in peculiarly isolated communities, the proper choice of instruments and the proper manipulations can scarcely

result in uterine perforation. Granting that an abortion has begun through previous criminal instrumentality by the patient or otherwise, the weight of authority is that the regular practitioner, now assuming charge of the case, should thoroughly evacuate the uterus, dilating and cureting if necessary. While reasonable care and skill are legally required and while the individual practitioner should set his own standard at a maximum, witnesses called by the court should clearly state the prevailing opinion of the profession to be in favor of instrumental emptying of the uterus, should emphasize the fact that, in the long run, the danger of sepsis and of subsequent inflammatory and neoplastic lesions of the uterus from neglect of this treatment, far exceeds that from the extremely rare accident of uterine puncture, with or without intestinal prolapse, should explain that the alteration of size and texture of the uterus during an abortion is such that penetration of its wall may, occasionally, occur, even with the most expert attendance and that, if the uterine wall is once perforated, no mediate tactile skill could detect the difference between intestine and secundines until considerable damage may have been done. Uterine rupture at or near term is also occasionally inevitable, and the fact that it occurs during endeavors to expedite labor rather than spontaneously, is by no means to the discredit of the accoucheur. If anything, the accoucheur should be blamed if the rupture occurs during a prolonged and difficult labor without instrumental or manual assistance. It is a matter for surprise that intestinal prolapse does not occur with greater frequency in uterine rupture, during labor. As a matter of fact it occurs only in about three per cent. of cases of rupture.

It is important to impress upon the profession and courts of law that the mere fact that intestine is brought down into the genital canal during labor, or after abortion, does not justify the indictment, much less the punishment of the attendant. In one of the early cases reported, the reporter seems to have been more concerned in securing the conviction of the attendant than in rendering prompt radical attention that might have saved life. The details, as published, leave some doubt as to the responsibility, at least in a criminal sense, of the convicted, first attendant but none at all that the reporter failed to give the patient whatever chance of life remained.

There are many deplorable, but, fortunately, rare accidents

that may occur in medical practice, including the one under discussion. The profession should be on their guard against them, but should be assured of legal immunity and professional sympathy when they do occur in the practice of careful and conscientious men. Without such assurance there will inevitably result attempted concealment of the occurrence, lack of skilled council, bungling attempts at radical treatment by those unprepared to render it or totally inefficient palliation, which here is literally an attempt to cover the condition with the mantle of obscurity. On the other hand, a fair understanding of the subject will obviate the terrible and hopeless mutilations that have occurred, will lead to prompt intervention to meet the conditions, so that the mortality need not exceed 50 per cent. and will probably be less than 10 per cent. Indeed, aside from immediate hemorrhage, previous depletion of strength, as in prolonged labor, and occasional implantation of septic germs in the peritoneum, the mortality of promptly and appropriately treated cases should be reduced to the one or two per cent., practically inevitable for major operations.

Undoubtedly, cases of this nature, occur much more frequently than the present bibliography shows. It is highly desirable that all cases should be promptly and fully reported, with statement of age and general condition, number of previous pregnancies and abortions, condition of the pelvis, course of previous confinements and pregnancies, apparent etiology and extent of the uterine or vaginal rupture, time and details of the operation or other method of treatment, and result both as to immediate recovery and subsequent events.

Including the author's case, a very thorough search of the literature reveals only ninety-seven cases in which the intestine or omentum or both, have engaged in the uterus and vagina through ruptured or instrumental openings. Sixty-nine of these cases (summarized under A. B. & C.) were incidental to rupture during labor, in most cases at term, in a few a month or two premature. In all but three of these the uterus itself was ruptured, the exceptions being cases 67, 79 and 91, in which the vagina was involved. The vagina was torn along with the uterus in a few others.

Twenty-five cases of uterine rupture occurred in connection with abortions, in a few due to instrumental abortion, in most to subsequent dilatation or clearing out of the uterus. In many considerable doubt exists as to the time of the lesion.

Case 57 was one of rupture of the vagina due to muscular strain, quite independently of pregnancy.

The only case closely analogous to the author's is 65, in which curetment was practised thirty days after delivery for a mass which, in the light of recent reports, may be considered as possibly syncytial. In the author's case, the curetment was practised five months after delivery at term, the symptoms of endometritis having preceded the pregnancy.

R. Klien of Dresden (*Arch. für Gyn.*, Vol. 62, 1901), collected 367 cases of uterine rupture in the literature of the last twenty years and added 14 cases, a total of 381. Among these were only 9 complicated by prolapse of intestine, less than 2.4 per cent. or a ratio of about 1.42. In 70 cases of rupture in which no operative treatment was undertaken, the mortality was 31 from hemorrhage, 18 from sepsis; total mortality 49 or about 70 per cent. Curiously enough in the series discussed under B. & C., the recoveries from uterine rupture during labor, complicated by intestinal prolapse, whether treated by abdominal section or, in appropriate cases, by simple reposition, amounted to almost exactly 70 per cent.

TABULAR RENEW OF CASES IN LITERATURE.

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| 1. Baudeloque. | No details. Died. |
| Quoted by Wm. Campbell. | |
| 2. M'Reever. | Term. Spontaneous rupture of uterus, 120 cm. intestine sloughed off on sixth day, fecal fistula closing spontaneously after two years, conception one and one-half years later, normal labor. Recovered. |
| <i>Lancet</i> , Vol. I, 1828. | |
| 3. H. D. Coe. | Term, multipara. Previous labor eighteen months before, child weighing 14½ pounds by forceps. Present labor, version in first stage and forceps to head. After twenty minutes, attempt at manual extraction of placenta, 90 cm. intestine followed hand. Reposition, removal of placenta, gauze tampon. Next day, extirpation of uterus, 120 cm. gangrenous bowel clamped and pelvis and vagina packed. Resection of bowel impossible at time. Death after 9½ hours. |
| <i>Am. Jour. Obs.</i> , Vol. 24, 1901. | |
| 4. Th. Noble. | Abortion, 4-inch fetus. Dilatation with instruments and fingers and removal of fetus and decidua. Three days later, fecal fistula. First operation, breaking up adhesions and |
| <i>Ind. Med. Jour.</i> , Vol. 21, 1903. | |

- mopping out pus from Douglas's cul-de-sac. Second operation, three weeks later, abandoned on account of collapse. Third operation, three weeks later, resection of matted intestine, anastomosis into rectum over rubber tube, removed after four days. Temporary fecal leakage at suture line. Ultimate recovery.
5. Alberti.
Oberstabsarzt,
Potsdam, 1894. Probably early, septic abortion. Five previous labors. Polypus forceps brought away tissue supposed to be retained fetus or decidua. Abdominal section three hours later revealed 17 inches of incarcerated (small?) intestine. Resection, recovery.
 6. Veit.
Discussion of No. 5. Details not given. Retention of placenta, three days. Forceps brought down coil of (small?) intestine. Reposition through vagina unsuccessful. Opening of Douglas's cul-de-sac, reposition of bowel, extirpation of uterus, per vaginam. Death from septic peritonitis.
 7. Gusserow.
Discussion of No. 5. Similar to Veit's case but only omentum prolapsed. Similar operation, except by laparotomy. Death on twenty-fifth day from pulmonary embolism.
 8. Orthmann.
Discussion of No. 85. Abortion, third month. Curettage. Removal of intestine by forceps. Disinfection and reposition. Immediate abdominal section. Intestine torn from mesentery, 6 or 7 cm. Resection of intestine, uterus and enlarged and adherent tubes and ovaries. Recovery.
 9. Olshausen.
Discussion of No. 5. Similar to No. 8. Resection. Death from acute sepsis. Necrosy showed that intestinal sutures were perfect.
 10. A. Martin.
Discussion of No. 5. Abortion. Operator removed 75 cm. of intestine by forceps after curettage. Stripped from mesentery, under notion that intestine was umbilical cord. Martin found woman in collapse, replaced intestine. Death.
 11. Van Riper.
C. S., *Med. News*,
Vol. 69, 1896. Multipara, last labor one year previously. Uterine hemorrhage, diagnosed as polypoid endometritis. Goodell's dilator used prior to intended curettage. Sound passed six inches. Forceps grasped what was supposed to be membranes but proved to be intestine. Van Riper called. R at in uterus enlarged to release intestine. Uterus and adnexa removed. 68 cm. of jejunum and omentum involved, 40 cm. minced by forceps. Resection, recovery.

12. F. Mendel.
Deutsch. Med. Woch.,
Vol. 28, 1902. 7-para. Seven months, macerated fetus. Spontaneous rupture of uterus. Reposition of intestine, in spite of contact with bed. Iodoform gauze tampon. Recovery.
13. Heinrich Peham.
Centralb. für Gyn.,
Vol. 26, 1902. 2-para. Justo-minor pelvis. First labor normal. Spontaneous rupture at term. Uterus filled with intestine. Reposition and uterus packed with iodoform gauze, pushed through into peritoneum. Recovery. Subsequent premature labor at seventh month, rupture of scar, Porro operation.
14. Toth. Same.
Vol. 27, 1903. 8-para. Aged 43, spontaneous rupture and escape of fetus and placenta into abdomen. Delivery by feet and umbilical cord. Reposition of intestine and gauze tampon. Peritonitis, abdominal abscess and hernia. Drainage. Recovery in three months.
15. J. A. Amann, Jr.
Munch. Med. Woch.,
Vol. 49, 1902. 5-para. Aged 30. Cross-birth, version, rupture uterus. Cecum torn loose from attachment, also bladder from uterus. Extirpation of uterus, suture of intestinal attachment. Normal salt flushing. Temporary vesicovaginal fistula. Recovery.
16. Emerich Ullmann.
Weiner Klin. Woch.,
Vol. 16, 1903. 6-para. Aged 36. Term. Manual emptying of uterus, curettage, intestine protruded at vulva. Abdominal section three hours later. 30 cm. of gut removed in vulva. Altogether 250 cm. of small intestine, beginning 1.5 cm. from ileocecal valve resected. Uterine tears sutured. Death two days later.
17. Boldt.
Cited by Ullmann,
above. Similar, details not given. First attendant had curetted, removed fragments of tissue and had torn a white tube in two. Laparotomy fifty hours later. Ileum separated from mesentery for 14 cm., gangrenous, almost divided at one point. Operation not described. Death.
18. Ullmann.
Same. 2-para. Aged 21. Laminaria abortion, time not stated. Curettage. Finger detected intestine. Reposition, at least into uterus. Ullmann did abdominal section fifteen hours later; 15 cm. of bowel torn from mesentery, 24 cm. resected. End-to-end anastomosis. Recovery.
19. Guthrod.
Zeit. für Geb. u. Gyn.,
Vol. 47, 1902. Abortion, two months. Bowel drawn down by forceps, reposition and tampon. Recovery. Subsequent abdominal section for adhesions.

20. Robiquet.
Jour. de Med. et de Chir.
2-para. Term. Aged 32. Spontaneous rupture. Forceps extraction. Small intestine and omentum protruded from vulva. Reposition interrupted by uterine contraction. Two days later, reposition of small knuckle of gut in uterus. Ultimate recovery.
21. Radcliffe Wood.
Lond. Med. Repos.,
Vol. 15
Primipara. Aged 24. Labor at seventh month. Putrid fetus expelled after three days' dry labor. Spontaneous rupture. large mass of intestine repositioned. Ultimate recovery. Seven months later, vagina blocked by hard, insensible substance.
22. John Stewart Currie.
Lond. Med. Gaz.,
Vol. 17, 1836.
3-para. Aged 28. Breech presentation. Spontaneous rupture after delivery of half of trunk. Placenta manually and incompletely removed. Intestine repositioned. Recovery.
23. Edward W. Murphy.
Dub Jour. Med. Sci.,
Vol. 15, 1839.
7-para. Term. Spontaneous rupture. Child in abdomen, easily delivered by forceps. Reposition. Recovery claimed but patient died from other cause on eleventh day.
24. Wm. Birch.
Med. Chir. Trans.,
Vol. 13, 1825.
4-para. Aged 29. Term. Spontaneous rupture. Version and perforation of cranium. Several coils of intestine in vagina. Reposition. Recovery.
25. Robert Collins.
Dub. Med. Trans.
6-para. Term. Spontaneous rupture. Perforator and crochet used. Same as preceding.
26. Hooper.
Lancet, Vol. 1, 1837.
10-para. Aged 32. Term. Rupture after ergot. Placenta and intestines expelled. (Sigmoid.) Intestine replaced and fetus extracted from abdomen by blunt hook. Death in a few hours.
27. Jas. D. Trask.
Am. Jour. Med. Sci.
Cited from unknown source.
Vol. 15, 1848.
Seventh month, labor following sudden hemorrhage. Shoulder presentation, version. Rupture and protrusion; intestine discovered after removal of placenta. Recovery and subsequent child.
28. Same
Aged 24. Version. Similar, sponge used to keep up intestine. Recovery.
29. Same.
Quoted from Duncan's.
Term. Spontaneous rupture, early in pregnancy, child and placenta easily extracted from abdomen. Recovered.
30. A. Monroe, Sr.
New Edin. Essays,
Vol. 2. Quoted by Trask.
Audible rupture of belly wall after three days' labor (two cracks heard). Intestines seen. Child and placenta expelled through abdominal wound. Recovery.

31. Percy.
*Observ. Acad. de
Chir.*, 1783.
Quoted by Trask.
6-para. Term. Arm presentation, spontaneous rupture, fetus delivered from abdomen. Symptoms of strangulated hernia. Death after one day. Viscera found gangrenous (?) at necropsy and bowel strangulated in uterine rent.
32. Smellie's Cases, Vol. 3.
Quoted by Trask.
Primipara. Aged 40. Term. Spontaneous rupture. Death in ten hours. Hernia of bowel through rent found post mortem.
33. M. Amussat.
Lond. Med. Repos.,
1820.
3-para. Term. Convulsions. Forceps tried in vain, extraction by feet. Rupture. Death. Post mortem, sigmoid found in uterus.
34. Geo. Cook Holmstead.
Same, Vol. 2, 1824.
4-para. Aged 26. Term. Contracted pelvis. Version and perforation. Intestine found in uterine tear. Death.
35. Dubois.
Chailly's Pract.
Treat. on Midwifery,
1844.
8-para. Spontaneous rupture, delivery by version from abdomen. Reposition. Recovery.
36. Bedford.
1 bid.
Term. Rupture of uterus and death of fetus ascribed to previous attendants. Death. Intestine between thighs.
37. Robert Collins.
Pract. Treat. on
Midwifery, 1835.
Primipara. Aged 25. Spontaneous rupture. Perforation. Placenta found in vagina, rent discovered, reposition and removal of coagulated blood. Death after twenty-five days. Rent nearly healed, but double psoas abscess.
38. W. A. Bedford.
*Tex. State Jour. of
Med.*, 1906.
3-para. Spontaneous rupture. Term. Fetus and placenta into abdomen, and intestine prolapsed. Abdominal section. Uterus sutured. Delivery through operation wound. Recovery.
39. Hans Pusch.
*Zeit. für Medizinal-
beamte*,
Vol. 5, 1906.
13-para. Rachitic pelvis. Aged 42. Labor induced three weeks early. Version ineffectual. Forceps tore off fetal head. Placenta followed, with loops of small intestine, repositied with iodoform gauze. Next morning, intestine gangrenous. Abdominal section; small intestine 2 meters long torn from mesentery. Resection, death, same day. Primipara. Aged 35. Criminal (?) abortion, fourth month. Fetid placenta removed on second day, followed by large intestine. Reposition. Fecal fistula and enema returned through vagina. Plastic operation and resection two months later. Death from shock; organs fatty.
40. Thos. Wilson.
Lancet,
Feb. 3, 1906.

41. Geo. W. Jarman.
Trans. Am. Gyn. Soc., 1905. Aged 34. Incomplete abortion, third month, two weeks before. Wylie's dilator used and then curet, which brought down intestine. J. then called, cleaned out uterus with finger, repaired intestine, which was not completely perforated, and repositied. Recovery, complicated by mural abscess.
42. Same. Four-months dead fetus, supposed to be dead seven months. Dilator caused rupture in old cervical scar. Intestine and omentum prolapsed. Reposition, recovery.
43. S. Palmer Dudley and Hanks.
Discussion of No. 42. Curettement, after abortion, perforation of uterus and escape of 20 cm. of small intestine. Reposition, recovery.
44. Wm. Hessert.
Chicago Med. Recorder,
Vol. 27, 1905. 6-para. Aged 46. Several miscarriages. Early abortion. Curetment brought out small intestine; repositied and iodoform gauze used in vagina. H. called and did abdominal section seven hours later. Bowel slightly bruised but mesentery torn, requiring resection of 80 cm. Recovery.
45. J. B. Harvie.
Quoted by Kelly.
See No. 44. 180 cm. of bowel cut off during curetment. No details.
46. Boblanck.
Gesell. für Gyn.,
Wurz. Abortion, curettement, loop of intestine pulled out by forceps. Resection, recovery.
47. A. J. Ochsner.
Discussion of same
paper, pub. in *Am. Jour. Obs.*
Vol. 51. Aged 36. Criminal abortion, 235 cm. 10 inches of ileum, pulled down between thighs, replaced in vagina. O. did abdominal section resected, end-to-end anastomosis. Recovery.
48. Frank T. Andrews.
Discussion of above. Criminal abortion, intestine pulled out in attempting to clean uterus. Death within an hour.
49. M. D. Mann.
Am. Jour. Obs.,
1895. Abortion, intestine torn across in cleaning uterus. Abdominal section; 15 cm. of ileum near valve torn from mesentery. Resection, implantation of ileum into cecum. Recovery.
50. Same, cited from
anonymous source. Abortion, placental forceps pulled down intestine; immediate abdominal section, reposition, suture of uterus. Death from septic peritonitis.
51. Same, cited from
anonymous source. Similar case. Physician lost his head and pulled out 180 cm. of intestine, thinking it fetal (three-months fetus), and cut it off. Death without operation.

52. Ely Van de Warker. Early abortion; middle-aged woman. Small intestine and omentum pulled down during curetment; abdominal section, resection of 10 cm. Death in collapse, next day.
N. Y. M. J.,
Vol. 78, 1903.
53. Wilmer Krusen. No details. Curettement pulled down omentum. Reposition. Abdominal section within two hours. Resection of involved omentum. Recovery.
Penn. Med. Jour.,
Vol. 5, 1902.
54. Joseph Hoffman. Delayed miscarriage, six weeks. Omentum brought down during curetment. Abdominal section. Recovery.
Ann. Gyn. and Ped.,
Vol. 3.
55. Francis T. Stewart. Term. 8-para. Aged 38. Podalic version, omentum followed placenta. Vagina packed with sterile gauze. Abdominal section after seven hours. Omentum and uterus extirpated. Recovery.
N. Y. Med. Jour.,
Vol. 78, 1903.
56. Edw. T. Hargrave. 10-para. Aged 39; negress. Term. Version. Fibroid tumor. Rupture probably preceded version. Loops of intestine prolapsed. Death before operation could be undertaken.
N. Y. Med. Jour.,
Vol. 79, 1904.
57. R. Rommel. 6-para. Muscular strain caused rupture of posterior wall of vagina and prolapse of intestine in mass of size of man's head. Reposition, in spite of strangulation and loosening from mesentery at one point. Vaginal tampon. Death next day.
Deut. Zeit. für Chir.
Vol. 64, 1902.
58. John H. Girvin. 5-para. Aged 23, negress. Shoulder presentation at term. Version. Rupture probably due to ergot. Intestines prolapsed. Prompt abdominal section. Extirpation of uterus, which was in shreds. Death from shock.
Am. Jour. Obs.,
Vol. 48, 1903.
59. D. S. Fairchild. Instrumental abortion. Soft catheter lost in uterus. Forceps pulled down 45 cm. of small intestine. Operation next morning revealed catheter in abdomen and intestine partly separated from mesentery. Resection. Death on table.
Annals of Gyn.,
Vol. 17, 1904.
(Quoted.)
60. Nutting Fraser. 9-para. Aged 45. Term. Version. Hand entered rent in uterus. Immediate hysterectomy. Recovery.
Med. News,
Vol. 82, 1903.
61. H. Schmidt. 2-para. Aged 25. Term. Justo-minor pelvis. Forceps unsuccessful. Craniotomy. Uterus found ruptured and intestines prolapsed. Immediate reposition, packing of lower uterine segment and vagina. Recovery.
Monats. für Geb. und Gyn.,
Vol. 12, 1900.

62. W. V. Woods. 1-para. Aged 25. Term. Spontaneous delivery. On seventeenth day, uterus found ruptured and containing intestine. Reposition, Recovery.
Monats. für Geb. und Gyn.,
Vol. 12, 1900.
63. N. Kolomenkin. 7-para. Aged 40. Term. Spontaneous rupture, perforation of child. Total extirpation of uterus. Recovery.
Idem, Vol. 17, 1903.
64. Beumer. Term. Transverse presentation. Attendant drunk, uterus partially torn from vagina, entire small intestine torn out, placenta missing.
Monats. für Geb. und Gyn.,
Vol. 20, 1904.
65. Dienst. 5-para. Aged 31. Curettement thirty days after labor. After removal of tumor from uterine cavity. Loop of small intestine pulled down. Abdominal section. Intestine not seriously affected. Repair of uterine rent. Peritonitis, gauze drainage of uterus. Recovery.
Same, Vol. 20, 1904.
66. Wirtz. 8-para. Aged 43. Term. Spontaneous delivery. Retained placenta. Bowel brought down during manual extraction. Death during transportation to hospital.
Monats. für Geb. und Gyn.,
Vol. 15, 1902.
67. Mörs. Term. Rupture of vagina by forceps. Intestine repositioned into vagina only. Death. Intestine gangrenous.
Discussion of No. 66.
68. Ludwig Seitz. Multipara. Spontaneous rupture. Child in abdomen, placenta loose in cervix. Porro operation. Death in two and a-half hours.
Monats. für Geb. und Gyn.,
Vol. 15, 1902.
69. K. Merz. 7-para. Aged 36. Head presentation, justo-minor rachitic pelvis. Perforation of cranium. Spontaneous rupture, version. Prolapse of omentum. Reposition. Rubber drain through tear. Death after nineteen days, peritonitis.
Arch. für Gyn.,
Vol. 45, 1894.
Quoting Piskacek,
1885, 1894.
70. Same, 1888. 4-para. Aged 33. Term. Oblique presentation. Rupture by midwife in attempting correction. Head in abdomen. Version and extraction. Prolapse of omentum. Reposition and gauze packing. Recovery.
71. E. C. Andrews. Term. Spontaneous rupture. Forceps extraction. Placenta retained and hand encountered it in abdomen. Ergot one hour later; intestine in vagina. Abdominal section and hysterectomy. Death soon after.
Lancet, 1887.
72. J. G. Pilcher. Aged 25. Term. Spontaneous rupture. Head in abdomen and prolapse of omentum. Abdominal section. Rent stitched and drainage by vagina.
Lancet,
Vol. 2, 1888.

NOTE.—All cases after No. 55 at term, except Nos. 57, 59 and 65.

73. G. Schleisner. 5-para. Term. Forceps. Reposition. Recovery.
Ugeskrift f. Laeger,
1884.
74. Schuchard. 3-para. Hydrocephalus. Placenta previa.
Inaug. Dis., 1884. Rupture after twenty hours' labor. Version.
Perforation of cranium. Reposition, irrigation.
75. Osterbind. 7-para. Justo-minor pelvis. Forceps at every
Dissertation, 1884. labor. Term. Fetus in abdomen. Perforation, cranioclasty. Reposition. Death after seven days, peritonitis.
76. J. D. Thomas. 9-para. Aged 35. Term. Mesentery grasped
Am. Jour. Obs., by hand in attempting to remove placenta.
Vol. 15, 1882. Child and placenta delivered from abdomen through vagina. Death from shock, eight hours after.
77. Federico Fornari. 2-para. Aged 27. Term. Spontaneous (?)
Raccog. Med., rupture, version. Reposition failed. Laparotomy, supravaginal hysterectomy. Death thirty-one years later.
Vol. 15, 1882.
78. Herman W. Freund. 9-para. Aged 43. Term. Rachitic pelvis.
Zeit. für Geb. und Forceps. Intestine and umbilical cord
Vol. 23, 1892. found on attempting to extract placenta after an hour. Reposition and iodoform gauze packing. Death after three days, peritonitis.
79. Same. 5-para. Aged 24. Spontaneous rupture.
Fetus in abdomen; abdominal section. Death sixty-six hours later. Uterus intact. vagina torn.
80. Same. 4-para. Aged 46. Contracted pelvis. Term.
Version. Intestine incarcerated in uterus. Abdominal section next day. Reposition by traction from above, intestine inflamed and covered with fibrin. Sublimate to intestine and endometrium. Suture of rent. Death after three days, peritonitis.
81. Riedinger. 2-para. Aged 31. Brow presentation. Forceps after fifty-four hours' labor. Complete rupture. Cranioclasty. Omentum repositioned. Iodoform gauze. Recovery.
Prag. Med. Woch.,
Vol. 15, 1901.
82. G. Walcher. Head presentation, hydrocephalus, spontaneous rupture. Reposition followed by Abdominal section. Hysterectomy. Drainage through vagina. Recovery.
Med. Correspondenzblatt des Württ. Aerztlichen Landesvereins,
Vol. 60, 1890.

83. Henry W. J. Cook
Lancet,
Vol. 1, 1898. 4-para. Aged 33. Rupture, version, slight prolapse of intestine, easily returned. Iodoform gauze packing. Death from shock, six hours later.
84. E. Stajmer.
Centralb. für Gyn.,
Vol. 19, 1895. 7-para. Aged 37. Feet presentation, spontaneous rupture. Intestine found prolapsed in seeking placenta. Reposition and iodoform gauze. Abdominal section, extra-peritoneal amputation of uterus. Drainage by vagina and preperitoneal space. Recovery.
85. Schäffler.
Therap. Monassch.,
Vol. 11, 1897. Aged 37. Term. Forceps. Placenta, followed immediately. Reposition. recovery.
86. Bäcker.
Centralb. für Gyn.,
1897. 3-para. Slight contracted pelvis; previous births normal. Perforation and cranioclasty. Manual extraction of placenta. Spontaneous (?) rupture. Omentum and loop of intestine prolapsed. Reposition impossible. Abdominal section three hours later. Porro. Death after seven hours, secondary hemorrhage from stump.
87. Dietel.
Centralb. für Gyn.,
1897. Term. Perforation of uterus in removing placenta. Abdominal section; 65 cm. of small intestine torn from mesentery. Much hemorrhage. Resection. Tear in ligamentum latum sutured. Death after a few hours.
88. R. Klien.
Arch. für Gyn.,
Vol. 56, 1898. 7-para. Lumbosacral kyphotic pelvis. Spontaneous rupture, escape of fetus into abdomen, head remaining in pelvis. Forceps unsuccessful. Cranioclasty. Reposition of small intestine. Manual removal of placenta. Reprolapse and reposition. Iodoform gauze. Recovery with rectovaginal fistula. Three unsuccessful operations on fistula.
89. Frank.
Centralb. für Gyn.,
Vol. 56, 1898. Primipara, flat pelvis. Aged 27. Forceps (?) delivery with much force. Child dead. Rectovaginal septum torn up to internal os. Omentum and portions of small intestine prolapsed. Reposition. Suture of uterovaginal tear and perineum. Recovery, four years later normal delivery.
90. Same. 6-para. Aged 29. Head presentation. Forceps unsuccessful. Collapse, child in abdomen. Placenta in vagina. Small intestine and omentum prolapsed. Abdominal section, transverse incision, decapsu-

- lation of uterus (author's method). Recovery.
91. Everke.
Berlin. klin. Woch.
1890. Aged 31. Transverse presentation with prolapse of arm. Spontaneous (?) rupture. Child in abdomen. Kyphoscoliosis. Placenta extracted from abdomen. Prolapse of three loops of intestine. Tear in rear and both sides of vaginal vault. Suture, iodoform gauze tampon of vagina. Recovery.
92. Everke.
Monasch. für Geb. und Gyn.,
Vol. 7. 6-para. Former births easy. Kyphoscoliosis splanchnoptosis. Spontaneous rupture. Child in abdomen, version. Prolapse of intestine. Reposition, suture of tear. Recovery.
93. C. Hubert Roberts.
Lancet,
Vol. 2, 1896. 8-para. Two abortions. Aged 31. Seven spontaneous births. Hydrocephalus. Rupture. Manual removal of placenta. Reposition of omentum and intestine gauze packing. Recovery.
94. Hochstetter.
Charite Anna'len,
Berlin, 1892-3. Uterus almost severed from vagina. Death. 29 cm. intestine separated from mesentery. Death, no details.
95. Klien.
Arch. für Gyn.,
Vol. 62, 1901. 9-para. Aged 37. Transverse presentation, spontaneous rupture, version, extraction of placenta from abdomen. Intestinal prolapse. Abdominal section after fourteen hours. Suture of uterine tears through serosa only. Recovery.
96. Same, quoting Burger. 4-para. Former births normal. Transverse presentation with prolapse of arm. Spontaneous rupture. Version. Reposition Ergotin. Recovery, in spite of coitus on fifteenth day. Spontaneous birth nine months and six days later.

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DISCUSSION.

DR. EDWIN WALKER, of Evansville, Indiana, reported a case of rupture of the uterus with prolapse of the intestine. He was called in the evening at about eleven o'clock by a fellow practitioner, who had previously been called to see a woman who had aborted at about the fourth month, to deliver the placenta. This practitioner used what is known as the uterine augur. He introduced the instrument, began to turn it, and before he realized what he was doing he had quite a large mass, which on examination proved to be the intestine. When Dr. Walker saw the woman fully a handful of intestines presented at the vulva, and quite a good deal of it was torn from the mesentery. He replaced it in the vagina, applied a tight binder,

had the woman taken to a hospital, opened her abdomen, and found thirty-one inches, by measurement, of the intestine, with mesentery torn away. He resected the intestine, using a Murphy button, but did not take any sutures in the uterus. There was very little hemorrhage. The parts came together so well that he thought it would have complicated matters to have used sutures; and the patient made a good recovery. He recalled one other case in which he punctured the uterus during curetment. The patient was a young woman who was suffering from endometritis. The uterus was rather sharply anterior. He used the dilator as usual (the Sims dilator) first, and then his curet, which went in very easily, and following its introduction some of the omentum came down to the forceps. He took a Bozeman forceps, replaced the omentum, and the patient had no further trouble.

He also saw a rupture of the uterus in which the intestine was drawn into the vagina during labor. When he saw the patient it was four or five days after labor, the woman being moribund, and no effort having been made to operate. Death, however, was clearly due to the prolapse of the intestine, which was allowed to remain in the uterus without interference. Dr. Charles P. Noble, of Philadelphia, had informed him personally that he had had a similar experience to his first case, in which he removed thirty-six inches of the bowel. Dr. Merrill Ricketts, of Cincinnati, told him that he had collected in that city two other cases in which that occurred, both of them with the augur.

DR. RUFUS B. HALL, of Cincinnati, said the essayist had displayed good judgment and great skill in getting the patient well. He believed that perforation of the uterus was more frequent than most physicians were willing to admit, especially in producing abortion. He did not believe there was often prolapse of the intestines in cases of perforation of the uterus. He recalled an experience in one season during his service at the Presbyterian Hospital a few years ago that impressed upon his mind forcibly the fact that these cases often ran in groups, or where in producing abortions uteri were perforated more frequently than was thought. Within eight days he had five patients in the charity ward side by side, who had produced abortions on themselves, and in so doing had perforated their uteri. These patients were suffering at various stages of infection. There was pus present, and all of them were treated by vaginal section, the pus being removed, and three of them recovered, but two died.

He reported an interesting case that came under his observation quite recently. The patient was a young woman, 27 years of age. He saw her in consultation with Dr. Van Meter, of Cincinnati, on the night of June 9. He saw her first that day. The woman had one child, about two years of age; she

had never been quite well after bearing that child, and for four or five months her health had been impaired. She was irregular in her menstruation; she had lost flesh. She was a frail little woman, and conceived the idea that she was pregnant. She went to a doctor to have an abortion produced, and gave his name. He introduced what was described as a uterine sound into the uterus, which hurt her some. There was little or no bleeding, and in three or four days he repeated the operation, and she said it hurt her very much. She had to take whiskey and medicine to relieve the pain before she left his office. She went home, and he visited her at the house, and two or three times, at intervals of a week, he attempted to produce abortion, and each time she had a chill and high temperature. She remained in bed after his first visit to the house. Her last visit to the doctor was about the last day of March.

Another physician was called in consultation a month or so before Dr. Hall's visit, who said she had a tumor in the abdomen larger than a man's head, and did not believe she was pregnant. This physician was a thorough, good practitioner, and a gentleman, and a man who would not produce an abortion. He was not called in the case again until the day preceding Dr. Hall's visit, when he saw her, and said the tumor had greatly increased in size, and thought the woman should be operated immediately. Both of these physicians were discharged. Dr. Van Meter was called to see the patient, and he called Dr. Hall. Her pulse in bed was 140 to 160; her temperature 102°-103°. She was greatly emaciated; her abdomen was larger than it would be at the full term of gestation. There was fluctuation. It looked as though she had an enormous ovarian cyst, but considering the history one could not believe that. He would say that the woman's history up to this time, as given to the Doctor and himself, could not be relied on, as the woman's mental condition was slightly impaired. She was not pregnant at the time the attempted abortion was made.

She did not menstruate on account of her poor health. She was advised to go to the hospital. The next day she was sent to the hospital at five o'clock in the evening, and the next morning operated at the Presbyterian Hospital. He opened the abdomen in the mid-line, and found that there were two gallons of pus in the abdominal cavity. The uterus was perforated from horn to horn; the perforation was filled with a piece of omentum, and the only operating done inside the abdomen was tying off this piece of omentum and closing the abdominal incision. She recovered promptly from the anesthetic and did well for twelve days, taking liquid nourishment nicely. When he opened the abdomen he could not recognize the fundus of the uterus on account of inflammatory exudate. About the twelfth day she began to get worse, and within twelve hours had intestinal obstruction, and they urged him

to open her abdomen. He said he could not do so, and attempted to liberate the intestinal obstruction with the woman in that condition. He expressed the belief that she would stand a better chance if let alone, and that he was not willing to do any more surgery inside of her abdomen. Up to that time she had taken liquid food thoroughly. A drainage tube was still in the abdomen, and a rubber tube through the wall. A good deal of pus came out, and for five days her life was despaired of. He washed her mouth, washed out her stomach, gave calomel, and at the end of the fifth day she passed fluid stools, and in twenty-four hours more the intestinal obstruction was relieved. She made a gradual complete recovery. He understood that she menstruated, for the first time, normally, ten days ago.

DR. JAMES F. BALDWIN, of Columbus, said that if we were to go into this subject of puncture of the uterus as an experience meeting, as they did a year or two ago at the meeting of the American Gynecological Society, he was sure that almost everyone present would be able to report one or two cases, and possibly a larger number from his own observations.

Dr. Hall would remember a case doubtless that he and the speaker saw many years ago at Columbus, of abscess, which proved to be fully as large as the one he had just described. Both were called in consultation. They did not know exactly what the nature of the case was, but both supposed the woman was pregnant. She had had one child years ago, when a physician punctured the uterus in trying to bring on an abortion. They decided that discretion was the better part of valor, and did not operate. The next day there was an enormous amount of pus discharged through the vagina and the woman promptly recovered.

He recalled two cases of perforation of the uterus that had occurred in Columbus, one in which a doctor, in curetting the uterus, brought out and cut away many feet of the intestine, which he gathered up, took out to the privy, and dropped it in and said nothing. The woman died.

In another case a physician delivered a woman of a dead baby with forceps, who had had a number of fibroid tumors interfering with pregnancy, and following the delivery of the child a lot of intestines came into the vagina. He poked the intestines back, and stuffed the vagina with cotton, which he found in the house. Dr. Baldwin saw the patient a few hours afterwards, when she was in a desperate condition. She was hurriedly taken to the hospital, salt solution was given, a few whiffs of chloroform were administered, the abdomen opened rapidly, and the woman placed in the Trendelenburg position, so as to get as much blood as possible to the brain. He did not know how it was done, but the uterus was practically detached, except a little shred of tissue half an inch in diameter on one

side and clear up against the diaphragm. It was completely torn loose from the application of forceps, but *how*, he had never been able to decide. The practitioner did not know that he had more than torn the uterus, but it was thus almost completely detached. The forceps was put on and the little shred of tissue snipped off and the uterus laid aside. There were several points of bleeding, most of the blood being in the abdominal cavity. The woman died about ten minutes after she was put to bed.

In the report of the meeting of the American Gynecological Society, the Fellows would find a large number of cases reported where the uterus was perforated during curetment. The speaker had done it at least twice, and in each case the curetting was preliminary to an abdominal section. In one case he did a hysterectomy; in the other the patient was let alone and recovered. At the experience meeting of the American Gynecological Society it was brought out that nearly all of these women with perforated uteri got well whether anything was done or not.

DR. WALTER B. DORSETT, of St. Louis, said it occurred to him that the practical thing to get at was how to deal with a rupture of the uterus. The cases might be classified in this way: Those in which there was rupture of the uterus during labor, either in turning or by the contraction of the uterus itself, termed obstetric ruptures. These were dealt with in one way, while a rupture or perforation of the uterus produced by a midwife or abortionist, or a rupture of the uterus by the regular physician accidentally in the delivery of a piece of placenta, or the curetment of the puerperal uterus, should be dealt with in other ways, on account of the character of the trouble and the causation. He would not hesitate in any case in which he was called, where there had been a perforation of the uterus produced by an abortionist, to clean out the pus, for the reason that the great majority of those who produced abortions were dirty and filthy in their methods, and there was always more or less danger of septic material having been carried into the uterus. It had been his fortune to operate on three such cases, and in all of them the abortions were committed by the same abortionist. In these he cleaned out the pus that was present, having seen the cases two or three days after abortion, and instituted vaginal drainage.

He recalled one case of rupture of the uterus in labor in which nothing was done. The intestine was pushed back, and the woman made a good recovery.

Obstetric rupture of the uterus during labor generally occurred by turning or otherwise in the anterior and lower portions of the uterus; whereas perforations and ruptures occurred on the posterior wall of the uterus; so that anatomically the site was different. If the rupture

was posterior, it was more apt to become septic on account of its proximity to the rectum, as well as the danger of carrying in infectious material. Cases in which there was an obstetric rupture were not as apt to be septic. Free hemorrhage would be the only indication for an operative procedure, such as opening the abdomen, finding the site of hemorrhage, and arresting it. It might be recognized by the issue of blood from the vagina, or by the pulse. The practical side of this subject was more as to the management of cases as they came to the surgeon, rather than a recapitulation of the number of cases that had been observed, or that had occurred in the practice of the different members of the Association.

DR. HANNAH M. GRAHAM, of Indianapolis, by invitation, recalled a case in which she accidentally perforated the uterus. There was also a laceration of the cervix. She repaired the lacerated cervix, but previous to doing so she curetted the uterus and accidentally perforated it. She diagnosed a slight prolapse of the intestines by the sense of touch. The intestines were put back into the abdominal cavity, and she felt that if the abdomen needed to be opened, this could be done later. If not, she would let her alone. She gave the patient some medicine and she recovered.

DR. JOHN YOUNG BROWN, of St. Louis, said, in spite of the teachings of military surgeons, civil surgeons were beginning to realize the importance of penetrating wounds of the abdomen; it mattered not whether the penetration was made by a curet in curetting the uterus, or by a bullet or stab wound, the consensus of opinion among civil surgeons was that all such wounds should be explored. It was his good fortune to have had quite a considerable experience in dealing with injuries of this character, and he was firmly convinced that we had learned very little or absolutely nothing from the statistics presented by men who had had wide opportunities for observing such wounds in military practice.

The early work of Davis, Vance, and a number of others, had refuted nearly every one of the teachings received from military men.

He agreed with Dr. Dorsett that in punctured wounds of the uterus, or in lacerations of the uterus, it was not so much the laceration as it was the sequence of the laceration that should be dealt with. The case in point he thought received excellent treatment; and he believed explorations of this character should invariably be made through the abdomen. It was the only way of determining the extent of the injury, and it was the only method that offered a means of repairing the injury done. He congratulated Dr. Congdon on the method he had used in resecting the bowel, that is, removing a wide area of bowel, getting well back into healthy tissue, and making the anastomosis below the ileocecal valve. In this connection

he took occasion to commend the Murphy button in emergency resection work. He had used the button extensively in gangrenous hernia work with satisfaction. He had never had a bad result which he could attribute to the use of the button, and he believed to-day that if he were to have an end-to-end anastomosis made on himself, he would prefer that the button be used.

At the Chicago meeting of the Association, he presented a very interesting specimen of a case operated on by him, where a double resection of the bowel had been done for gunshot wound, attended with multiple perforations. The button was placed above the Connell suture. It passed the Connell suture without difficulty. The patient died six months after operation, and in the specimen it was with the greatest difficulty that he could locate the point at which the anastomosis was made with the button, and the Connell suture showed a very distinct diaphragm.

There was one point he wished to refer to that had only been hinted at, and that was these patient arrived at the hospital, generally speaking, in the midst of shock and the abdomen was generally filled with blood, and these cases were not irrigated. He was irrigating less and less every day in gunshot wounds, bowel perforations, and in strangulated hernia cases, where the patients were shocked. He did not irrigate with the idea of cleansing the peritoneal cavity, but irrigated for the purpose of stimulating the patient. It was his practice in all these cases to open the abdomen and begin irrigation as soon as possible, and by having salt solution running slowly into the peritoneal cavity one could see at once an improvement in the condition of the patient.

With reference to drainage, he invariably drained in any case where the bowel had been perforated. He put a drain in the vesicorectal pouch and generally through the stab wound, and put the patients in the Fowler position.

DR. CONGDON, in closing the discussion, said, with reference to the question of how to deal with a ruptured uterus, he had tried to make that as clear as he could, and the point he wished to bring out was, that every case stood by itself; that where there was little hemorrhage; where the bowel was not injured, and the patient was near or at term, probably simple reposition was all that was indicated. On the other hand, those cases due to abortion, or attempted abortion, or to the clearing out of the uterus following abortion, should all receive abdominal section.

Dr. Brown had misunderstood him in regard to irrigating the abdominal cavity. He did irrigate the abdominal cavity in the case reported. Shock in his experience always meant hemorrhage. In all cases of ectopic pregnancy, with severe hemorrhage, the patients were placed on the table practically pulseless, and one would be surprised if he saw them in a few

minutes, after they were placed back in bed, after the vessels had been tied, to see the condition or improvement in the pulse. If one would examine them every two or three hours thereafter, every time the pulse was taken, it would be found to be stronger, fuller and slower.

He considered the Murphy button one of the most valuable adjuncts in intestinal surgery that we possessed to-day.

DR. HUGO O. PANTZER, of Indianapolis, Indiana, read a paper entitled,

THE RECTUM IN ITS RELATION TO DISEASES OF WOMEN.¹

BY

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Indianapolis, Ind.

THE experienced gynecologist is conscious of the existence of an important relation between the rectum and the female genitalia, both in health and in disease. In contrast with this stands the fact that the current literature and textbooks on gynecology are remarkably deficient in this regard; and it may be assumed that there is a corresponding deficiency in the teaching of students. These thoughts are basic to the following remarks. The writer offers nothing new, but hopes that, if his views are concurred in, the discussion of this matter will lead to its correction.

The sparsity of literature on this subject and the inadequate reference to it in textbooks on gynecology is too obvious to require substantiation. A superficial consideration of the subject, touching a point here and there, will meet the limited scope of this paper and serve to introduce the subject.

There exists a clear anatomic and physiologic relationship between the rectum and the female genitalia by which a variable influence of the function of the one is exercised over the other. In susceptible individuals there often arise disturbances for this reason, closely bordering on the pathologic. The contingent excitation of the rectum during menstruation may result in looseness or costiveness of the bowel sufficient to require attention. Remedies ordinarily employed for the relief of constipa-

¹Presented at the nineteenth annual meeting of the American Association of Obstetricians and Gynecologists, held at Cincinnati, September 20-22, 1906.

tion may be contraindicated at the catamenial period on account of their effect on menstruation.

A faulty function of either of the organs under consideration may arrest or modify that of its neighbor. Chronic constipation at times affects the quantity, frequency, or course of a menstrual flow. A case recently observed, showing exceptionally clear etiologic relations, is of unusual interest.

A young unmarried female of rarely fine development and health, whose menstruation for years had been exceptionally normal, acquired an anal fissure while straining with a costive movement. This had existed one year when the patient complained of amenorrhea of several months' duration, attended with continuous tenderness and bloating throughout the lower abdomen. These symptoms became aggravated at the monthly period time, but there appeared at most a moderate leucorrhea. Examination showed normal genitalia crowded forward and upward by an immense fecal impaction extending from rectum to cecum. Remedies applied exclusively to the correction of the bowel function fully reestablished the menses.

A retardation of rectal function, with its sequel of membranous colitis, is the most frequent concomitant of genital disease; diarrhea is not rare. The constipation resulting from a hypersensitive left ovary deserves special mention. It produces spasticity of the rectum and retrouterine ligaments, which is the cause of the constipation. The cases often go unrecognized as to their causation. Symptomatic treatment may aggravate the disease.

The writer, in a paper entitled "The Pelvic Musculature in Disease," read before this society at its Chicago meeting in 1903, called attention to the widespread distribution of unstriped muscle fiber in the pelvis; to its important clinical bearing; and to the failure of most textbooks to mention it. Starting out from the muscular organ, the uterus, and continuous with its fibers everywhere in the pelvic subperitoneum there is found a more or less definite layer of unstriped muscle fiber, named by Savage, the pelvic platysma. In some parts the muscle fibers collect in such quantities as to constitute definite organs which, functionally, are the parallel of the voluntary striped muscles.

In the case of the retrouterine ligaments so called, the collections of these fibers were designated by Luschka the *musculi retractores uteri*. Other such collections occur in the round ligaments,

along the base and the upper margin of the broad ligaments and in the various cystic ligaments. They are distributed around the vaginal and rectal canal in definite, heavy layers, possessed of great contractile power. In the well-developed young nullipara the presence of these contractile structures is easily recognized, and the negative evidence is found in the average multipara. The variably torn, attenuated, and atrophied bands and platysma in the multipara, often further changed by the advent of inflammatory disease, contrast strongly with the well-defined, closely-drawn corresponding structures of the unblemished youthful female. This array of muscular tissue, including also the muscles of the pelvic floor, participate variously and distinctively in the manifestations of disease or these parts. These manifestations have distinct clinical significance. Their knowledge should be made subservient to diagnosis and treatment of pelvic disease as is done in collateral fields of surgery. Greater and finer distinctions in pelvic diagnosis, would limit the oftentimes worse than useless routine treatment of the office practitioner, and would lead to a more discriminating and apt application of the principles underlying operations. A routine operation for the gross lesion was recently witnessed at a great clinic. A woman diagnosed as having a prolapse was operated upon by a modified Tait method. The uplifted vaginal mucosa displayed the two ledges of levator ani muscles in great development and virginal intactness.

Nothing daunted, the operator carried out his routine. Three transverse sutures boldly seized the intact bellies or plates of muscles; and when they were tied the muscles were drawn into an anterior displacement to the rectum. The further steps taken are irrelevant. It remains simply to say that a large roll of posterior vaginal wall lay above the line of the levator ani muscles. It was in evidence throughout the operation, silently but none the less clearly pleading for its diagnostic recognition. It was evident that an extensive laceration and attenuation of the muscular tissues of the vault of the vagina and rectum and the retrouterine ligaments had preceded; and that the sequential loosening of the upper rectum from its mooring to the sacrum had followed. The prolapse pertained entirely to this upper region. The operation did nothing to repair this. It sadly disarranged nature's disposition of the levator muscles. The question comes up, what will be the result?

One who rarely examines by rectum inadequately understands the importance and advantages of this procedure. Changes from the normal condition of the pelvic structures can hardly be read so satisfactorily as by rectal touch. It yields more than the vaginal touch because of the quasi-unobstructed sway it affords in all directions to the examining finger. As compared with it the relatively short, narrow and thick-walled vaginal pouch is movable to a small extent, and only against the resistance of the various muscular structures attached to it either directly or through the medium of the uterus. This pressure more or less benumbs the tactile sense. It seems commendable to examine every new case both by vagina and rectum. This should hold true, particularly with the beginner. It has been the invariable rule of the writer for many years to examine both by vagina and rectum, and many are the instances where the rectal touch revealed the true diagnosis.

The above-mentioned instance of a hypersensitive left ovary serves well to demonstrate the activity of these muscles, especially in the young individual where the pertinent muscular structures are yet unharmed by the accidents of parturition. The vaginal touch reveals the uterus drawn downward to the left and backward. The vaginal vault posteriorly and to the left presents an unyielding, board-like hardness, in which neither the base of the broad, nor the sacrouterine ligament can be differentiated. This hardness may extend to the right side. While the finger rests in gentle contact with the structures, in some instances the fixed parts relax, showing that the rigidity is due to a spastic contraction of the musculature. Now the enlarged and tender ovary can be discerned. Sharp contact with the ovary may at once reawaken the spastic contraction. In contrast with this experience the rectal touch at once enables us to distinguish all outlines. The drawn base of the broad ligament and the retrouterine ligament stand out in bold definition. The ovary is felt and can be measured and moved about. The contracted muscle is felt to yield under the finger; or by gentle massage or traction it can be made to relax. Commonly it is possible to differentiate between a simple spastic contraction and a structural inflammatory contraction. The latter will not yield to massage or traction. By this method the beginner can be spared the error of diagnosing a pelvic inflammation with infiltration.

As a matter of fact, rectal touch is practised little; and text books commonly barely mention it, much less dilate upon it. None speak of its practical superiority over vaginal palpation. The lingering fecal odor upon the finger, which is due to a fault of technic and is entirely avoidable, deters many from utilizing this means of diagnosis. The beginner should employ the rectal touch to get his first true impressions of the pelvic organs in the body; and the expert cannot afford to dispense with it.

The variable conditions of the rectum, as found by both vaginal and rectal examination, are of great diagnostic and therapeutic interest, and should invariably be noted. The rectum in the multipara always shows deviations from the normal, connected with the events of parturition, and the puerperium. In the sequence these deviations become accentuated. Remarkable differences are recognized which certainly have different bearings and should have varied treatment, medicinal and operative. Making due allowances for individual peculiarity, there are—namely: (a) displacement of the rectum owing to severed attachments or supports; (b) undue fixation by scar bands, inflammatory adhesions, tumors or displaced neighboring organs; (c) different states of dilatation or contraction, of emptiness or fulness; these are combined with atrophy, hypertrophy, or relaxation.

Under (a) are of particular interest cases where the bowel is no longer a straight organ, but is tortuous, at times describing a figure of S extending in its course from the upper rim of the pelvis to the anus. At times the arms of this letter reach from one side of the sacrum to the other. Under (c) are found the cases where atrophy or loss of tone allows feces to collect in the rectum without its ability to move them on; or where, as above described, a painful ovary excites reflex contraction of the bowels, preventing feces from passing the painful point, and where long persistence of the condition has resulted in hypertrophy and undue excitability of the rectum. Both conditions cause constipation, but they call for different treatment.

The writer is reminded of the faith in aloes which his former teacher, Dr. Thomas B. Harvey, possessed. No doubt it acts well and is truly indicated in many cases, yet it is easy to see where its employment is directly contraindicated. So, also, the folly of routine treatment of prolapse of the uterus or lacera-

ation of the perineum, by one or another method of operation, as frequently advocated, becomes freely apparent as soon as we make a more discriminating and careful investigation into the different conditions prevalent in the individual case. A careful search into the condition of the pelvic musculature must be included.

The rectal temperature in pelvic diseases has especial significance. The oral temperature in these cases is often misleading. The rectal temperature may be anywhere from one half to three degrees more than the oral temperature. The recognition of a febrile disease or its gravity may depend upon this procedure, making it obligatory to take the record at both sites. Textbooks are singularly silent on this differential reading.

Feeding and medication by rectum cannot be overestimated. The rectum absorbs as greedily as the stomach, and when due attention is given to the proper selection of food and medicine, the rectum in times of disease may exceed the powers of the stomach. The latter always, and especially during disease, is subject to psychic moods and reflex disturbances, which impair its powers. The rectum goes practically untouched by these influences. Medication by rectum in pelvic disease has special virtues, as for instance, when sodium salicylate and saline solutions are given, which are taken up by the same lymph channels that carry the bacteria and toxins of disease. Thus the medicine exerts an immediate antitoxic and diluent effect upon the morbidic materia. It also greatly stimulates peristalsis and so obviates the need of an oral administration of purgatives.

This discourse has served its purpose, if it is suggestive in recalling the possible important relations existing between the rectum and the female genitalia. Out of these relations grows the need of a special chapter in textbooks on gynecology treating of this matter.

224 NORTH MERIDIAN STREET.

DISCUSSION.

DR. W. A. B. SELLMAN, of Baltimore, Maryland, expressed himself as having great faith in the rectal touch. He considered it a great aid in making a diagnosis of the conditions which existed in the pelvic basin. Where there was a shortening of the structures around the uterus, the broad ligaments; where there were deposits or tumors, it was a most valuable aid. By

abdominal touch, or by vaginal examination, we were often uncertain in regard to the position of an enlargement that was present in the pelvic basin. If we depended upon bimanual touch, with the finger in the vagina, and the hand on the abdominal wall, it was impossible at times to differentiate and to decide exactly where this enlargement was located. By relaxing the sphincter ani, either by stretching, or by the use of a 4 per cent. solution of cocaine, placed on a cotton pledget, and left there for five minutes, we were able to introduce two or three fingers into the rectum and to reach the higher structures, and many times he had been able to decide that a cyst was located in the broad ligament, and that it was not a fibroid tumor or a cyst of the ovary.

Again, he thought that the condition of the circulation in the rectum, what was called a hemorrhoidal condition, or dilatation of the venous channels, had a great deal to do with the circulation in all of the organs located in the pelvic basin. Women, as a rule, suffered with constipation. It was not unusual for a patient to say that she had an evacuation from the bowel anywhere from six to fourteen days ago. This inactivity permitted a venous stasis in that viscus; it interfered with the rectum circulation, and the muscles located in the walls of the rectum lost their tone, and finally, the bowel became nothing but a flabby bag. If we examined the patient, we would find that while fecal matter came down, a certain amount of it remained in the bowel. The same condition obtained in cystocele. We had a bag in which the urine was collected after the woman evacuated the bladder, and when she stood erect there was a dribbling of urine from the sac. Very much the same condition existed in the rectum at times. A woman might have an evacuation of the bowels every day, but if she did not normally empty the bowel, it retained this condition of venous stasis in that viscus.

With the essayist, he laid great stress upon the value of rectal examination, and thought if it were carried out thoroughly, we would be able to recognize diseased conditions, especially existing in the pelvic basin, which we would fail to diagnose by other means of examination.

DR. CHARLES E. CONGDON, of Buffalo, said that, as the essayist was reading his paper, and in listening to the discussion that followed, he tried to recall a single case in which, by vaginal or bimanual examination, he was unsatisfied with the diagnosis. He had not made a rectal examination, although the patient had been put in every conceivable position. It was not necessary to confine these examinations entirely to women. One would be surprised to find he had an aid to appendicitis diagnosis if he made a vaginal examination. He had located the appendix a number of times in the pelvis by rectal examination, and if one carried it one step further and examined the feces, in many

cases he would be surprised to find that the patient had a chronic mucous colitis, which would explain a great deal of the abdominal pain from which these patients suffered.

EXHIBITION OF SPECIMENS. A CASE OF COMPLETE ABSENCE OF LUNGS.

DR. WILLIAM M. BROWN, of Rochester, N. Y., by invitation, exhibited a specimen and reported the case of a child that was born at full term. Its mother was brought into the hospital after having been in labor for several hours, with a defective heart, or broken compensation. He finished the dilatation and had his assistant deliver with forceps. He was watching the mother. The mother did very well; everything appeared to be perfectly normal; delivery was fairly easy, although the child was large for the pelvis. The woman was a primipara. The child weighed nine pounds and six ounces, and so far as the delivery was concerned, everything was all right. There was no laceration, and the mother's circulation was improved by the administration of salt solution. But as soon as the child was delivered it made frantic efforts to breathe; it was not able to make any sound. The pulse showed that the heart was beating all right; but the child became blue. He took the child from the nurse, while his assistant was looking after a post-partum hemorrhage, and began artificial respiration. He attempted to inflate the lungs, and forty-eight minutes after delivery the child's heart kept beating, and he kept hoping it would begin to breathe, but he was unable to get any air into the lungs, and finally the heart ceased to beat. The child, externally, was perfectly formed. He could see no mucus in the child's throat or trachea. He could not find any reason why the child died. He demanded to find the reason. The family were Jews and did not care to have an autopsy made. Finally, he insisted on it, and obtained an autopsy, with the result of finding practically a complete absence of the lungs in the chest of this child.

He exhibited the deformed heart, with the absence of the posterior portion of the right half of the diaphragm. The peritoneal cavity, nearly from the liver, was above the diaphragm; all of the small intestines were above the diaphragm, and the heart was crowded over and out of its usual position. There was a small bit of lung tissue in the apex on each side, which was a clear reason why the child did not breathe.

TWISTING OF THE FALLOPIAN TUBE WITH GANGRENE, WITHOUT IMPLICATION OF OVARY.

DR. JAMES F. W. ROSS, of Toronto, Ontario, reported a case of twisting of the Fallopian tube with gangrene, without any implication of the ovary.

A few weeks ago he was sent for to go to a neighboring town,

twenty miles from Toronto, to see a woman whose acquaintance he had made in the far distant city of Winnipeg some years ago. She married. She was taken with a violent pain in the abdomen in the middle of the night. She sent for a doctor, who came to see her, and he thought she had intestinal indigestion. Having been a trained nurse in Philadelphia, she came to the conclusion that her pain was too severe for an ordinary indigestion, and decided she needed further advice. She telephoned him to come to see her, contrary to the advice of her doctor. He went and found rigidity of the right rectus muscle; some elevation of temperature; vomiting; and tenderness on pressure over the region of the appendix. He diagnosed acute appendicitis. The physician said he did not view the case in that light. However, the woman was brought to St. Michael's Hospital, Toronto, and her abdomen opened to the right of the right rectus muscle, when he came down upon the cecum and found the appendix normal. He looked into the pelvis and found a black mass, which proved to be a tubercular tube that had become completely twisted on itself about one and a half times; it was strangulated, and the ovary below it was perfectly healthy. The tube was black and gangrenous. The tube on the other side showed evidences of tuberculosis, so that the woman had had an attack of salpingitis with tubercular disease of both tubes, and as the consequence of some sudden force this tube became strangulated. He asked her afterwards about it, when she was recovering, and the only way she could account for it was that she had turned the crank of her brother-in-law's automobile, and in so doing felt pain. The pain ceased, and returned at a later period. He tied off the tube with catgut, left the ovary in place, closed the abdomen, and the woman recovered.

As yet, he had failed to find in the literature a similar instance of gangrene of the Fallopian tube from twisting.

HYDROSALPINX WITH TWISTED PEDICLE.

DR. JAMES F. BALDWIN, of Columbus, Ohio, in connection with the remarks made by Dr. Ross, reported the following case:

Mrs. A., aged 43; married twenty-three years; no children; one miscarriage two years before, at five months, as the result of a fall. Patient was seen at 12:30 A.M., September 21, 1899, in consultation with her physician, Dr. Emerick. The evening of the 19th she missed her chair in sitting down, and thus fell somewhat heavily on the floor. She laughed over the occurrence, and thought nothing more about it. She had had a little feeling of discomfort in her pelvis for about a week. At midnight, three hours after the accident, she was awakened by intense pain in the pelvis, which was so severe that two hours later she was seen by her physician. He found her very

sick. She had been vomiting. He saw her during the day at intervals, and tried to get her bowels opened by physic, but this failed. She vomited persistently all that day, but had not vomited two hours previous to Dr. Baldwin's consultation. Examination disclosed pronounced tenderness at McBurney's point, and her chief complaint was in this region and a little below it. The diagnosis seemed to rest between acute appendicitis and some trouble with the appendages on the right side. Her temperature was a trifle below 100° ; pulse, 80. At 9:00 A.M. the patient's temperature was 100.5° ; pulse, 95. Abdomen much distended. She had been vomiting again all the latter part of the night. She looked much worse than when seen at midnight. No change in local conditions. No movement of bowels. An immediate operation was urged and assented to. Patient was at once removed to the hospital, and the operation made at 2:30 P.M.

When the patient was under the anesthetic the presence of a cystic mass back of the uterus and to the right of it seemed to indicate that the trouble was probably not of the appendix, and the abdomen was accordingly opened in the median line. Bloody serum at once welled up out of the incision. On pushing the distended intestines out of the way, a gangrenous cyst was found in the pelvis, this cyst having a twisted pedicle. On bringing the cyst up it was found to be an old hydrosalpinx, and was removed in the usual way, without disturbing the ovary. Hydrosalpinx was present on the opposite side, which was removed at the same time, together with the appendix, which was found to be the seat of chronic inflammation, and which had been attached to the right tube. Patient made an uneventful recovery.

Examination of the specimen showed it to be about the size of a large fist, and to contain in addition to the serum, quite a quantity of blood, which had evidently been extruded as the result of the twist.

THE TREND OF THE TIMES IN APPENDICECTOMY.¹

BY

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At intervals during the past centuries certain symptoms have been recorded which are now known to be characteristic of appendicitis.

Disease of the appendix was, however, first recognized less

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than one hundred and fifty years ago; then the subject lay dormant for another seventy-five years, when it was given a definite scientific status through the efforts of two Frenchmen. But even the accurate descriptions of Louyer-Villermay^{1,2} and the well-founded theories of Mélier³ were not utilized by their contemporaries in the profession; this for two reasons: First, because Dupuytren, the leading surgeon, too narrow to realize the importance of this great opportunity, remained an exponent of the thought of his times, which referred to the colon the origin of the right iliac inflammatory processes. Second, because the German School, in applying the name "peri-typhlitis," a term so apropos of the general belief, both encouraged and confirmed that erroneous opinion, which, indeed, has in some quarters hardly been obliterated in our own day, as has been so prominently illustrated in the history of King Edward's recent illness.

After fifty years of semi-obscurity, Krönlein⁴ performed the first appendicectomy on February 14, 1884. Though in the midst of an acute attack, the abdomen was closed without drainage, and the patient died within twenty-four hours.

In 1886 Hall⁵ of New York had the honor of the first successful operation ever performed for appendicitis. Two years later Boston, in the person of Reginald Fitz,⁶ produced an epoch-making paper, which cleared the atmosphere of former, false notions, by defining the relationship between appendix and colon. Our best surgeons, with thought and skill no longer misdirected, were not slow to discover that while operative interference as a last resort is good, the same measures applied earlier, and during the interval, produce far more satisfactory results.

Surgical treatment for chronic appendicitis was given a powerful stimulus by McBurney⁷ in 1889 when he demonstrated the feasibility of operating without destroying the muscular continuity of the abdominal wall. Since this time McBurney's muscle-splitting incision has been the standard. In 1894 Morris⁸ read a paper entitled "The inch-and-a-half incision and week-and-a-half confinement in appendicitis," which elicited a great deal of discussion both favorable and otherwise. Noble⁹ of Philadelphia, stands for the overlapping of the fascia: he also advocates the larger liberty and therefore increased comfort of the patient. Within the last six months Bayard Holmes¹⁰ has published his personal experiences under the title "The

Short Narcosis, the Short Incision, the Short Stay in Bed After Ideal Operations."

The writer, who has worked along similar lines for more than thirteen years, is fully convinced that the next step in progressive surgery is the perfecting of the technic, with an eye single to the best good of the patient, even to the smallest details; mere recovery is no longer all-sufficient.

The ideal condition is health; operation approaches the ideal in proportion to its elimination of time, pain, and danger in illness. These undesirable elements may be more surely and fully eliminated than we have been accustomed to think possible, if in addition to the essentials we have heretofore considered necessary we give due attention also to certain points which have been too long neglected.

The first of these is the choice of anesthetic. The ideal anesthetic is yet to be discovered. Ether and chloroform are certainly a great advance over the methods in vogue prior to their discovery, yet even they are too frequently followed, not only by the expected discomfort, but by disastrous results. Hewitt¹¹ gives the mortality from chloroform as one in three thousand; ether one in fifteen thousand; while from nitrous oxide and oxygen there has been, so far as he knows, no fatality recorded. The Science Committee of the British Medical Association,¹² in an elaborate report on anesthetics, has demonstrated that 25 per cent. of the experiments with ether showed albumen in the urine afterward. Dr. Robb¹³ says that 17½ per cent. of his operative cases have albuminuria. Within the past four months one of our principal hospitals has recorded three deaths following ether narcosis; these took place a few days after operation, with complete suppression of urine. In my experience with nitrous oxide and oxygen, now extending over a period of six years, such lamentable accidents do not occur.

Another strong point in favor of gas anesthesia is the fact that, even after major operations, the patient is rarely prostrated by nausea. So slight are the after-effects that, not only examinations, but minor operations are performed in my office upon patients who, within an hour or so, take a car, or walk home without discomfort. On the other hand, ether given merely for examination, frequently requires detention in the hospital for several days.

The method of operating is of utmost importance. The in-

cision should be just large enough to give access to the field of operation. All surgeons agree theoretically with this statement, but practically, one finds three quarters of an inch sufficient for a favorable case, while another requires two or three inches. When the condition is more complicated the former is successful through an inch and a half incision, the latter barely satisfied with an opening from four to ten inches in length. Of course, the first surgeon requires a physical diagnosis approaching exactness; he places the incision immediately over the appendix, and is especially careful to injure the abdominal wall as little as possible.

The extent of the skin incision is of no importance, except for cosmetic effect; if the patient is fleshy this superficial cut may, of necessity, be a long one. In aseptic cases the fascial separation should be only sufficient to admit the tip of the index finger; this is crowded through the soft parts, which are easily dilated to admit the entire length of the finger.

A careful examination is made of the parts within reach; ordinarily the anterior border of the liver, lower pole of the kidney, ascending colon, ileum, and, in women, fundus and right tube and ovary can be palpated. The appendix is located, its condition noted, also the presence or absence of adhesions. If movable, the appendix is brought up to the incision by hooking around it the finger, which is then withdrawn; the wound is held open by a pair of retractors, the omentum pushed aside with one pair of forceps, with another there is brought through the opening the appendix, to be ablated by any method the operator may select. Senn¹⁴ introduced the use of one or two Lambert stitches to close over the former site of the appendix, thus leaving no raw surfaces for the formation of adhesions.

As soon as the head of the colon is replaced, the muscles of the abdominal wall so adjust themselves that there is no opening into the abdomen. Though probably unnecessary, it has been my habit, as an extra precautionary measure, to close the peritoneum with one stitch and secure the overlapped fascia with one more.

Dr. Crandon¹⁵ of Boston has recently demonstrated that the same skill and method which have proven so successful in chronic cases may be also applied, though with slightly modified technic, to acute appendicitis.

Given an anesthetic with little, if any, attendant nausea, an

incision so short as to close of itself, and there is no physiological reason for the recumbent posture. The writer has gradually shortened not only the incision but also the time spent, of surgical necessity, in bed; for not infrequently, whether from physical overwork, or nervous strain, patients need, and should have, a course of the rest cure.

It is the surgeon's business to do the best possible for every case, no matter how unfavorable. But the ideal operation can be performed only upon an ideal patient; one who is intelligent, obedient, hopeful and of good recuperative ability, both mental and physical; having well-developed muscle and fascia, without excess of fat, and a movable appendix with a good mesentery; one whose condition is uncomplicated by intercurrent disease, or by severe sequelæ, the result of previous attacks. Such a case will make a more complete, as well as speedier recovery, if allowed more liberty during the after-treatment than has been ordinarily deemed advisable; water and other liquids may be given earlier, and in quantities sufficient to satisfy. While the stay in bed is usually from two days to a week, there are patients who experience great relief from a sitting posture within a few hours of the operation, this is especially true of the obese, and of persons possessing a sensitive alimentary canal. Some cannot, unassisted, evacuate either bladder or bowels in a recumbent position; one such took a step or two several times during the evening, although the operation had taken place a little after noon of the same day.

Not yet has my practice afforded a single example of hernia, or any other injury, or even of discomfort traceable to liberal after-treatment. On the contrary, it has been my good fortune to note the absence alike of adhesions and mental disturbances, but an increase of appetite, of bodily vigor, of cheeriness, and even of confidence in the surgeon, as a result of this method in convalescence.

One "ideal recovery" was back in his office at work four days after operation; another walked upstairs before the close of the third day and entertained guests on the porch a few hours later. A member of the staff of one of our principal dailies was caught in a snowstorm ten days after operation; he walked five miles to shelter without harm of any kind.

These three points, choice of anesthetic, method of operating, and liberty to the safe patient, are by no means the only ques-

tions of importance connected with the ideal operation. The patient's selection of operator; time of operation, during the interval, if possible; proper hospital environments, including operating room, and corps of assistants trained to cooperate with the surgeon in charge; these and many other considerations are of moment in every case; but attention has been given in this paper only to those points which, in my judgment, have suffered neglect, or have been the subject of discussion only to be decided unwisely.

Who are the leaders in this movement toward the ideal? A comparatively small number of physicians and surgeons, among whom may be noted our keenest thinkers and most skillful operators. And the followers? All who have experienced themselves or have observed in friends the happy results of successfully eliminating time, pain, and danger from the sick bed. A gradually increasing constituency, drawn from the better educated classes, may be heard, even now, demanding advanced surgery, that shall promote the well-being of the patient with little or no regard to the ease of the operator.

Opposition to the ideal operation is widespread but intangible, therefore the more difficult to combat. Laymen, especially those who are not abreast of the times in other respects, have an indefinable feeling that any departure from the "flat-on-your-back theory" of our grandfathers is medical heresy; with such, however, one practical demonstration changes conservatism into championship. The same cannot be said concerning the majority of the surgical profession; many of whom witness a short incision, admit its happy results, then, instead of adopting the method, proceed to raise various and sundry objections.

One operator says it is easier to work through a long incision; one, that the opening should be enlarged lest the appendix be not found within reach; another that the traumatism of a small incision might result in gangrene of the abdominal wall; still another claims that a long incision will heal just as rapidly as a short one. Such criticisms are based either upon inexperience or upon lack of skill. But what answer shall be given to a prominent surgeon, the head of a large hospital, who says, "this cures our patients so quickly that they and their friends, not appreciating what has been done for them, are liable to refuse to pay the bill"?

Not a few medical members of the profession believe in the *method of operation*, but are awaiting further testimony and more indubitable proof before deciding in favor of *liberal after-treatment*, a matter which is of much the lesser importance. Such an attitude seems to me both safe and sane. But history protests against our paralleling the mistakes of Dupuytren, who rested upon past attainments rather than seize the opportunities of the future.

Strong men of independent thought have set out simultaneously, and without collaboration, to blaze the trail of ideal surgery, while an intelligent and progressive public follows close upon the heels of such frontiersmen. These are unmistakable symptoms of the trend of the times.

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CITIZENS' BUILDING.

POINTS COMMONLY CONTESTED IN THE DIAGNOSIS AND TREATMENT OF APPENDICITIS.¹

BY

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SEVENTEEN years ago I presented a paper entitled, "Surgical Conception of Peritonitis." Many of you discussed it strongly and fully. That grand old past-master in surgery, Dr. Vander Veer, opened the discussion with the remark, "to one brought up in the school of opium treatment, as those of us were who have practised in the immediate vicinity of New York and that part of the East where the teachings of Alonzo Clark prevailed, it seems as though we were living in the land of dreams, when we are told to give opium, opium, opium." We have in our society a surgeon very renowned in peace, as he was steadfast in his duty toward the wounded during his long military service in the Civil War. He says now that he would like to live again through the misery of all his sad experience, just to save his cases of abdominal gunshot wounds. The surgical conception of the etiology, pathology, and treatment of all varieties of traumatism and peritonitis has led to the abandonment, not only of the dicta of the past, but to its utter and entire demolishment. Good and active practitioners, fine pathologists, excellent diagnosticians, bring us the simple cases and tell us, "one or two days or weeks ago, I had a man badly shot, another badly stabbed, six or more perforations of important viscera. I opened promptly, repaired the lesions, tied the offending

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vessels, and made a toilet." Such stories convince us that our work has not been done in vain.

We rarely hear an allusion to idiopathic peritonitis; no reference is made to opium or the sheet-anchor treatment, and but little is said about calomel and salts. I am satisfied that most operators familiar with septic and infectious or perforative lesions of viscera, are convinced that calomel and salts are harmful and worthless. As yet I have learned of nothing that stays the progress of gangrene of the appendix, or in the least lessens the accumulation and dissemination of its pathological products. We know that some patients toil for their loaves and fishes with a gangrenous appendix in the iliac fossæ or pelvic basins; children go and remain in school with a gangrenous appendix and a puddle of foul-smelling fluid in the pelvic basin, extending up to the right kidney.

I have had a number of patients travel hundreds of miles, two of them across this continent in the last month, with free pathological products in the peritoneal cavity and pelvic basin. Only a few weeks ago, one from St. Louis wandered with greatly impaired locomotion to Atlantic City, N. J., with a huge puddle of pus filling his pelvis, and lifting all viscera quite to the umbilicus. A modern toilet and drainage was enough to save him. If these subjects are not kept too long, or until the processes of deep decomposition are too advanced, we can save them, and use chloroform for the anesthetic. I had the honor and pleasure of assisting Dr. Thomas G. Morton of Philadelphia, in doing the first premeditated operation for appendicitis in Philadelphia. He and his pupils did the operation often; recognized the precise nature of the disease, and boiled the symptoms down to four or five cardinal points to work by. I do not wholly agree with Dr. Murphy, when he says, "here is the place to say that of the voluminous literature on appendicitis, practically 99 per cent. can be entirely ignored, leaving only the epoch-making articles of Krönlein, Kraft, Fitz, Bull, Sands, McBurney, Roux, Sonnenburg, and a few others." I appreciate choice literature, but I am sure you will sustain me when I insist that the reports and brief, but numerous, discussions of the active surgeons had more to do with establishing the new pathology, diagnosis, and treatment, than the library epoch-making articles referred to. Let me name a few of the leaders: Morton, Hunter McGuire, Lewis McMurtry,

the Davis brothers, Robert Morris and J. B. Murphy. While Murphy was not an early worker, he has never laid down the hammer, and has done more to refine and perfect both the surgery and literature than the whole group of authors to whom he so generously gives the glory. He forgets how Morton, Davis, Morris, McMurtry, and members of this society traveled over this great country reeducating the profession. Some of the authors to whom he refers we have never seen in a society meeting room. Murphy very justly belongs to the group of whom he says, "Americans should be given the whole credit of forcing the surgical practice to its present high standard as a life-saving procedure." Many are much interested in the function of the appendix; I know but few good surgeons who are especially concerned about its function. I am satisfied it is a rudimentary organ and an offending anatomical cesspool and culture medium, a storehouse for venomous germs or their recolonization. I am sorry that many, in their sublime ignorance of this important subject, do not stop inquiring about its office, and think more about the pathology, diagnosis, and early treatment.

Like gunshot and stab wounds of the abdomen, we have not fixed in the minds of the profession or the people that appendicitis is wholly a surgical affliction; that therapeutics, except that coming under the head of good nursing, is entirely useless and strongly favors delay and procrastination, primarily giving a high mortality. "While dealing with pus and gangrene, gangrene and pus daily, one naturally seeks a solution for the appalling pathological conditions that should never occur, except out of the reach of intelligent clinicians. The unfavorable conditions referred to are more common now than ever before in the history of this subject, and but few appendicitis operations are done early." The delays have been put in various forms; olive oil as a remedy we disposed of quickly, like sulphuretted hydrogen as a specific for phthisis; stupes and poultices are about forgotten; the rest and starvation treatment is a part of the old opium treatment; cold storage and lavage are not new or true, but revived by authors of great prominence, and have had a large spreading influence, difficult to combat. The diagnosis rarely puzzles an intelligent physician; but few errors are made. The results of early treatment are pleasing to all concerned. The delayed operations give a strictly culpable mortality, the fatal cases having been

under treatment four to nine days after a precise diagnosis. Unfortunately, a good many surgeons do not recognize approaching dissolution or urge the early surgery that saves. If one succeeds in what seems hopeless on the operating table, he is emboldened to try it again and again.

I find in the reports of some good hospitals that patients suffering from appendicitis remain in the medical wards until dead, no surgical effort being made to save them. This simply means that the pure clinician does not yield the point that it is a surgical affection. It also means that the clinician has not a precise knowledge of pathology, that he has not served his apprenticeship as a resident or an aid to a surgeon. When the operations are complete, the recoveries pleasing, reopenings or secondary operations for a variety of complications, ileus, etc., are not necessary. One prominent operator reports twenty-four cases of ileus in his work. This simply means that his work is defective. Multiple incisions and drains in both the pelvic and abdominal cavities are insults, both to surgery and to the peritoneum. Most operators have succeeded in saving their desperate cases by a small or a generous incision; the multiple incision and drain only favor an additional point for complications. Reopening one's own patients and those of others for early and late postoperative sequelæ is an important schooling for the operator. I object to all imperfect and superficial methods. With a good working knowledge of pathology, we learn when delayed, that the appendix is deep in the pelvis and loins, and that the peritoneal cavity is infected throughout; that the toilet and drainage must be quite general to save the patients. Acute local infections are easily stayed by limited surgery. Recent authors give a chapter entitled, "Pelvic Appendiceal Abscess." The enormous percentage of angry gangrenous and perforative forms of appendicitis we find in the pelvic basin or over the ileocecal line is simply surprising.

Kelly gives important statistics of "Pelvic Appendiceal Abscess." In 22 cases of abscess originating in the appendix, 7 were found situated in the pelvis. Another found 40 which were pelvic, out of 132 abscesses starting in the appendix, and of these there were 27 in which the appendix itself was located in the pelvis. In 21 cases out of the 40, the pus was situated in the pelvis alone, while in the remaining 19, the pelvic abscess was associated with an extension to other regions. Out of

the 21 cases, in which the abscess was confined to the pelvis, there were 7 in which it was concealed in the true pelvis, and not perceptible to abdominal examination, but in 14 cases it could be felt through the abdominal walls. In the 19 cases of pelvic abscess with extension, the right iliac fossa was the seat of the second abscess 14 times, and in every instance the iliac abscess was isolated from the pelvis. In three cases the extension of suppuration was into the left iliac fossa. Out of 24 pelvic cases collected by another author, the suppurative process was confined to the pelvis in 11 cases, in 7 there was an avenue of communication between the iliac and the pelvic abscesses; in 4 the pelvic suppuration was secondary to iliac abscess; and in 2 there was a pelvic abscess with bilateral iliac diverticula. Sometimes there are two abscesses, one surrounding the appendix in the iliac fossa, and another filling the pelvis; they may be entirely distinct from each other, or they may communicate more or less freely over the train of the pelvis under the adherent coils of the intestines. I quote this to demonstrate that walled-off theories are pathologically rare, and that the surgeons are commonly the unfortunate victims of their faith. I have known a good number of surgeons to wholly overlook pelvic puriform accumulations while finishing a groin operation, to be reopened one, two, or three days later, because the patient was doing badly.

Waiting and watching should not be taught or practised, either in private or public, under skilled or unskilled observation. We know that perforations occur under our eyes, and that good clinicians watch and endeavor to limit spreading peritonitis and infection, with quick disastrous results. Most good surgeons admit that they are distressed and unhappy while watching and waiting for an appendicitis that has not been operated upon. A perforation, a spreading infection, does thrice more harm, and kills thrice as many patients as an inexperienced operator in an early operation. The patient's chances are lessened by holding off until a well or illy-defined or multiple abscess or abscesses have formed. At one time we had little or no experience, and but little manual dexterity, with a cloudy knowledge of the disease and a strong desire to unlearn and re-educate ourselves. The modern pupil or ex-resident possesses refined knowledge of pathology and diagnosis, and surgical resources, methods and materials that we could not even hope

for. Now, with this splendid preparation for going on with this important work, why should we ever leave it to nature or blind chance, or the watch-and-wait methods? Our accumulated knowledge of the pathology, diagnosis and extensive sequelæ of the disease is accurate. I rejoice that the laity are demanding more of us, demanding a precise diagnosis and early interference.

We must both teach and encourage men to prepare for this great work. Our assistants and pupils obtain successful results. The object lessons at our operating tables are of immense practical value to physicians with but little experience in general surgery. We must simplify every detail to avoid the risks of such men handling infected tissues, and spreading an infection of a local nature.

Early in the history of the Johns Hopkins Hospital, the surgeons taught that drainage was an admission of imperfect or dirty surgery. A short time after this criticism they reported a case of general septic or purulent peritonitis saved by general or multiple drains, pelvic, central and loin drains. Since the recovery of that patient, about all the surgeons connected with the institution have scientifically practised and taught drainage. It is difficult to discuss the subject of exposure and manipulation; some operators, fortunately few, cannot do abdominal operations, except through openings from bone to bone. One came to our city and did four gall-bladder operations. They all died. I was greatly surprised about a year later when I was summoned to save a fifth, who was dying from bowel obstruction. I found about all the abdominal viscera fastened firmly to that lengthy incision. I make this reference to fortify the point I wish to make in regard to rude manipulators or rude operators. Some men cannot possibly eviscerate a patient without killing. Others can lay out all the intestines, free general agglutination, make either a wet or a dry toilet, and cleanse dirty infected bowel and omentum, clean empty loins, pelvic cavity, puncture distended bowel, collapse it by freeing it of its gas and contents and replace all, with a recovery. Before toilets of any character were practised, all such cases died, and it is only recently that many good surgeons were willing to admit that any of such could be saved. Drainage rarely does any harm; it always does good when well placed. The lower vaginal or rectal methods of drainage always seem more in-

fectious or septic than the upper methods and more difficult to keep clean. I am very fond of toilets and drainage and I have not had a phlebitis or a sepsis of any form follow an operation for many years; but I have seen grave local and systemic infections vanish in a few hours after both wet and dry toilets.

A careful review of the work of active operators, where the material is abundant, shows great improvement in both the simple and complicated cases. They are all doing more finished work. Recently I reoperated on five patients from the same hospital. They had enough surgery for a hundred primary simple cases; one had had her tubes and ovaries removed twice or thrice, her appendix removed three times, adhesions freed once, and one section for a hernia. When I reopened I was promptly convinced of the possibility of the regeneration process; the organs were all there.

241 NORTH EIGHTEENTH STREET.

DISCUSSION.

DR. JOHN B. MURPHY, of Chicago, said there were two or three points he would like to refer to in connection with these papers. *First*, in regard to the ideal operation mentioned in the first paper. Surgeons were all seeking an ideal operation. He objected to the order in which the first essayist placed the importance of his points. He put pain, time and danger in the order of importance, while the speaker would say danger first. Everything else was of minor importance.

Much had been said of late about the small incision for appendicitis, which every man should favor within the limit of his capacity to do effective work without hazard to the patient. That was the key to the length of the incision. One man could go into a china-shop and turn around without breaking all the dishes, while another could not.

As to the means of recognizing the appendix after the abdomen was opened, he had found that the best way to find the appendix was to pass the index finger of the left hand into the incision on to the anterior abdominal wall and down over the iliac vessels as they were felt to pulsate and come up, and one would uniformly bring up the mesoileum. Then, one should follow the ileum on. The appendix might be under the liver, but the ileum would bring one to the caput. This was a very simple and effective way of finding the organ. He believed that one would find it by this route more frequently than by any other. One could thus locate the mesoileum, which was the most fixed point in all that quadrant of the abdomen.

He was pleased that the subject of anesthetics came up,

for if there was anything the medical profession needed to be "jogged up" on, it was anesthetics. He hoped the members would pardon that expression, but it was the most forcible one he could use. It was not the type of anesthetic particularly that was attended with danger, because chloroform could be given to an individual with safety; ether could be given with safety uniformly for a short period of time without drowning the patient. One could use ethyl chloride or nitrous oxide gas; but these anesthetics should be given with brains. Operations were not done with instruments; they were not done with incisions and with anesthetics solely, but were done with brains.

As a profession, we had accepted the view that these operations should always be done before the appendix had perforated. It was agreed that that was the safest time. We had not already agreed as to when to operate, where the case had passed beyond that time, and he had given this very much attention in connection with his work on peritonitis, and he was more and more convinced every day that the statement which he made in a discussion at the Toronto meeting, in 1894, that "now is the accepted time of operation," was the one that he would act on, and he would operate on every case just as soon as he got it. He had had that illustrated very forcibly in the last eight or ten days. The mortality of his last cases had not been from peritonitis, but from pylephlebitis, which occurred in the first few days, when septic material was retained in contact with the portal circulation, and which gave us that type of infection that we were powerless to deal with. It did not occur early. It usually occurred after the sixth or seventh day, and if the surgeon waited he ran great risk or danger. There was an effect produced by the work of Dr. Ochsner in his encouragement of delay, and that was, up to that time, when surgeons operated, they did too much tearing or work in the peritoneal cavity. Too many fresh abrasions were made in the presence of virulent pus. Surgeons did not want to do what the gynecologists did. In gynecology they had to deal with adhesions; they had to deal with ancient infections, with tissues that were infiltrated, nature's barrier put up there, which could not be absorbed any more than cheese would absorb. That was true in gynecology. Schultze's able paper showed that 80.25 per cent. of all pus in the pelvis was sterile, and in the presence of that one could tear up adhesions and yet the patient's life was not hazarded. We could deal with an acute virulent, infectious appendicitis in the first, second, or third day, but in the fifth, sixth, seventh, eighth, ninth, and tenth days the danger increased. Why? Because then organic adhesion were broken up, while in the second or third day agglutination adhesions were separated; there was a large amount of infiltrated surface that did not absorb. Results were obtained

because surgeons recognized the dividing line between an adhesion that was dangerous when separated, in the presence of infective material, and an adhesion which was not dangerous in the presence of infective material. It was in the work of the latter that we were going to make net profits in the future. Surgeons were not going to traumatize any tissue that was capable of absorption.

DR. ROBERT T. MORRIS, of New York, said the remarks of Dr. Murphy were in line with the trend of opinion to-day. He agreed with the points made by Dr. Murphy, and with those made by Dr. Price.

What is the keystone of success in appendicitis work? Conserving the natural resistance of the patient. If the surgeon caused an explosion in his works, his wheels would not run. Surgeons did too much work conscientiously, and therefore damaged their patients. They committed taxidermy upon them. They employed unwise anesthetic methods. They consumed too much time in doing nice, ideal work. They made too many incisions in order to get at all the points of infection, and their statistics were bad because they forgot the keystone principle of conserving the resistance of the patient which would do all of these things better than the surgeon, and prevent the patient from manufacturing in his works the leukocytes which would destroy the infection and carry on repair. The patient was a machine. He was a factory. His only business at the moment when the surgeon was called in consultation, was to manufacture leukocytes. He was a leukocyte machine. If one were a favorite visitor, should he step into the works, disarrange the machinery, and stop this factory from going on. This was what surgeons had been doing along the line of the old principles, which taught that all infection should be removed. This was where surgeons went wrong in the early days of appendicitis work. They were trained under that teaching to remove all bacteria from the skin, to remove all bacteria from their hands, to remove all bacteria from the field of operation, and after the surgeon got into the abdomen, to remove all bacteria that he could find there. This was a stumbling block. In their early surgical work surgeons did not try to conserve the patient's resistance in trying to get out all infection. This was why some men had given up surgery. They started in with the idea of removing all infection, instead of leaving it to the machine.

How could the surgeon conserve the natural resistance of the patient. A short incision was one way of doing it. Very little damage to the patient was done by a short incision. A too large incision had been known to kill a bear, and precisely the same principle applied to a patient. The incision, after all, should be governed by the limitations of one's experience. The use of a very short incision in appendicitis work required

a higher degree of technical skill. Were surgeons to drop it because it required a higher degree of technical skill? Did the best mechanic in a locomotive works put aside his work because it required a higher degree of technical skill? Did the great artist cease to put on his finishing touches because it required a higher degree of technical skill? No. Give the world that higher degree of technical skill. Teach that if other men could not do it, it was their fault. Get as near as possible to the highest degree of technical skill in reducing the amount and degree of surgery. It was the degree of surgery that men conscientiously did that had made terrible statistics in appendicitis work in the past. He would not advise any beginner in surgery to use a short incision; but to an audience of masters, he would say, give us room for the use of the higher degree of technical skill. Let the patient have the benefit of it.

Another way of lessening the resistance of the patient was by bad methods of anesthesia. The length of time employed in operating was another way of lessening the resistance of the patient, or in interfering with the factory, because the surgeon produced shock every minute he was at work. If a surgeon put a patient under an anesthetic and cut his hair for an hour and a half, it would cause more shock than it would by doing a severe abdominal operation, getting in and out in fifteen minutes, so that time was a matter of great consequence, and almost all abdominal operations could be completed on an average in about fifteen minutes. There were hardly any operations in the whole field of abdominal surgery that could not be completed in on an average of about fifteen minutes. The fifteen-minute standard was a good thing to keep in mind for all abdominal operations.

DR. J. HENRY CARSTENS, of Detroit, agreed with Dr. Murphy, in reference to practising ideal surgery. Surgeons ought to try and get their patients well in the shortest possible time. But there was certainly a limit to some of the points that had been brought out. Dr. Carstens could not see how it was possible for a patient who had had an incision made in the abdomen that might have been carefully brought together with sutures to get up and move around a day or two after the closure of that incision without stretching it more or less apart, and rendering the wound weak. It was utterly impossible for him to believe anything else. Dr. Morris, who had made experiments on scar tissue and new unions, found that it took about eighteen days to get firm union. He asked him whether this was not correct.

DR. MORRIS replied, yes; eighteen days before the tissues became as strong as normal tissues.

DR. CARSTENS said he had borne that fact in mind. If he operated on a patient, he kept the patient in bed for about

ten days or more, having adhesive plasters applied snugly across the abdomen to prevent the wound from separating very much until there was quite firm union.

As to hernia following operations, he operated on a boy four years ago. There was perfect union of the wound. He was perfectly well, but suddenly last spring, four years after the operation, he began to have a little bulging, which increased until he had a hernia at the line of incision. This case showed that even after four years there was still a weak point, no matter how carefully the incision was closed.

As to the time for operating on a case of appendicitis, he said that when he saw a case of this disease that needed an operation, it did not make a particle of difference to him whether it was to-day, to-morrow, or whether it was one or four days, he would operate on him on that day, because he maintained that the longer one waited, the more the patient's power of resistance would become lowered, and there would be complications. The time to operate was when the diagnosis was made. This, however, did not say that one should not, in exceptional cases, wait until to-morrow, or even two days sometimes. But the general principle ought to be understood that the time to operate on a case of appendicitis was when one saw it.

Surgeons did not know as much about operating formerly as they did to-day. They operated better now. They did less. They were not afraid. They did not care whether they always moved the appendix or not. Now, sometimes the appendix was left. The surgeon might consider it necessary to drain the appendiceal abscess for the time being and remove the appendix later. Sometimes patients were saved by not doing ideal surgery.

DR. LEWIS S. McMURTRY, of Louisville, said there were two points connected with the surgery of appendicitis that the operative surgeons were not agreed upon, and those should be carefully considered. It should be borne in mind and published that this discussion was by a body of specialists who were daily dealing with appendicitis, because what went out from this Association was authoritative and the personal equation of the surgeons was lost sight of and hence a great deal of harm resulted. The two points he called attention to were these: Dr. Ochsner, an honest man, a man of ability, a surgeon of vast experience, had promulgated a system of treatment that had been very generally adopted by the profession, and since this had been done there had not been, by such a body as this, any thorough discussion of the subject. The question that the Association should discuss was, was there a class of cases of appendicitis, to which the operative surgeon was called after the initiation and advancement of the disease had been such that it was safer to defer operation than to operate? When

the surgeon operated in a case of suppurative appendicitis, when should he proceed to do a complete operation, and when should he stay out? It was known that there were cases of suppurative appendicitis in which a short incision and leaving the wound open would not complete the operation. If one cleaned out a puddle of pus two fingers below the iliopectineal line, he would find another puddle.

The speaker was called in a case within the last two weeks, in which a thorough operation had been done, and yet the patient was now in danger of losing his life by an abscess opening through the lung, and he was expectorating pus through the lung. An eminent surgeon did a thorough operation the first time less than a fortnight ago. But this abscess that was now opening through the lung was shut off from the other abscess, and if drainage could have been established, instead of allowing drainage through the lung, the probability was that the boy would now be well, whereas he was making a struggle for his life, which was of doubtful issue.

Should there be any exceptions whatever for the whole profession, not the experts, to defer an operation? Should every case, regardless of conditions existing, be operated on the minute it was seen? Were there not exceptional cases? He admitted that the system that was promulgated by Ochsner had done much harm by furnishing the nonoperative practitioner with a means of resorting to delay, to expectancy, as if based on sound surgical principles, which it was not. What rule ought to be established for the profession to go by? Were there any cases that should be deferred? It was known that there were, and such cases had been described. The question was, how to formulate some plan and let the profession in the decision of the question of operation exercise judgment as to how to deal with the cases in hand. This was the first point.

The second was as to the technical operation,—when to stop. Gynecologists established this field of surgery as they did all peritoneal surgery, and it was not parallel to deal with such vicious infection, such conditions as were found here, on the same basis as with sterile pus. While in some cases the surgeon might fail, as in the case of abscess opening through the lung, which he had mentioned, the abscess deep in the pelvis shut off, to do what was necessary for the patient by a simple incision, still it could be said that the surgeon's judgment must be exercised in individual cases.

It seemed to him that there ought to be more discussion with regard to the establishment of a rule of conduct that would be applicable in a general way to these various important points.

DR. CHARLES A. L. REED, of Cincinnati, Ohio, said, that when the members of the Association began to formulate principles and doctrines, those doctrines had the force of law in the

community and held practitioners to a standard of responsibility. Therefore, the formulation of general principles of conduct should be approached very seriously and should be discharged with extreme conscientiousness. He could not see any way by which this end could be accomplished here or by any other deliberative scientific assembly. We needed, however, to have some sort of foundation upon which to stand for protection and for the protection of the patients. He had boxed the compass both ways, with reference to the question of appendicitis. He began by operating when the diagnosis was made, then it seemed to him occasionally he was doing that which no conscientious surgeon cared to do—namely, a unnecessary operation. He began to study his cases with reference to discriminating which cases to operate on and which he should not operate on. He thought he had this question definitely settled; and yet, in the course of three weeks, he had had a peculiar experience.

He was called to see a case of acute appendicitis, in which the symptoms were apparently all receding, and he said, let them recede, and when the patient got along so that he could operate in the interval, the operation could be done safely. Convalescence from the acute attack did not imply a complete recovery. Generally, these patients did not consult the surgeon, because they took their temporary recovery as a final one. Two such patients of his had since had acute attacks and were operated in the midst of those attacks. The persuasive power of pain was a very important thing in getting a patient to do his duty in an acute attack.

On the eve of those cases he was called to see a patient in a neighboring city and found him in charge of a previous surgeon. The symptoms in this case were receding. He simply said he would let them recede, as he had had five cases in which all of the patients had done very well, and he thought he would let this case go on, too. The next morning an operation was decided on; the nurse was there that night, and said to him that the patient was getting better; that his temperature had declined from 103° to 99° ; pulse, 80, and there was disappearance of tenderness. There was no particular tumefaction. He thought he would operate in the interval. The next morning the patient wanted to get up and declared he would do so. He was not permitted to get up, although it was difficult to keep him in bed. At eleven o'clock he had what might be termed an explosion, and the next morning at two o'clock he was dead—a terrible experience.

Within the last two weeks a fellow practitioner called him and said, "I have a case of appendicitis for you to operate on this afternoon." He went to see the patient, and said to the practitioner, "When did you see the patient first?" He said, "I saw the case last night." When Dr. Reed saw the patient,

he was getting better; but he thought of the lesson he had learned from previous experience. The pulse had come down; the temperature had declined; tenderness was receding. He said to the patient, "I will operate on you." The patient was taken to the hospital and operated on promptly. After making the incision he was able to reach the appendix without any difficulty, lifted it up, and found it was very tense, so much so that it reminded him of intraocular tension. There were two areas of granulation, with a small green area on the peritoneal surface. He lifted up the appendix as gently as he could, protected the wound in every possible way, tied off the appendix, dropped it back, closed the incision, and everything was getting along very well. The next morning there was a little elevation of temperature; the second morning the edge of the incision looked a little red, although there was not an intraperitoneal symptom. The patient's bowels moved. The stomach behaved well. There was no distention of the abdomen. He opened the wound and it was as black as a black garment, one of the worst cases of localized wound infection he had ever seen. There was a gangrenous wound from incidental contact with the appendix that was at the point of rupture, and he believed would have ruptured in the next fifteen minutes or two hours. That was the condition of affairs revealed under receding symptoms, hence he was disposed to defer the operation a little while, so that the patient might get into the quiescent period, and then do the operation in the interval.

A number of cases of that kind had taught him an important lesson, so that he had boxed the compass, and now did not feel safe or justified in assuming the responsibility of deferring operation in the presence of an acute appendicitis, and he should not do it. If operation was deferred, it would not be with his counsel and advice.

Pus in the pelvis or abdominal cavity was always dangerous, and appendicitis was always potential pus. This should be remembered. One could not get away from that dictum. Therefore, after an experience that had been all too vacillating on his part, but undertaken conscientiously to find some ground upon which he could stand and to justify himself and do his duty to his patients, he stood a confirmed convert to the principle that appendicitis ought never to be trusted, and the time to operate was when it was found.

DR. JAMES F. W. ROSS, of Toronto, said he was particularly pleased to discuss this subject, owing to the fact that it was in his native city that Dr. Murphy made the statement that he would operate on every case of appendicitis as soon as the diagnosis was made; that he would not wait for the patient to have another attack. When he made that statement a chill went through the audience. Many of the old practitioners were there at the time and heard him make that statement.

But that time had gone by, and there was no further question about the time to operate. There was no doubt that operation should be done at once, before perforation took place. But he was something like Dr. McMurtry, in that his early experience taught him that it was dangerous to fool with adhesions in the presence of such virulent material, for he had had a number of deaths.

He expected, in the discussion on Dr. Murphy's paper, to relate his experience with reference to difficult purulent peritonitis. He had had a number of deaths from that condition. He then adopted the plan, if the period was reached when there was a mass and he wanted to relieve tension, of making an incision, putting in a piece of gauze, and leaving the case alone, as he had found that by disturbing these adhesions on the fourth or fifth day, absorption was so great that the patients died. This practice did harm. Other patients were then afraid of having an operation done. Interference in these cases, attacking and pulling a viscus out, and cleansing it off, only opened up and exposed the rest of the cavity to germs, and this was an extremely dangerous procedure at present. Whether he should change his present position later on it was difficult to say.

As to waiting for an attack of appendicitis to pass off and doing an interval operation, he had for a considerable period ceased to do that. When once the diagnosis was made, say within three or four days, in his opinion there was nothing but the knife for the patient. It was the treatment he would want applied to himself if he had appendicitis, with adhesions; but if he had reached the fourth or fifth day, he should think carefully before he submitted to an operation, and he would want to know what the surgeon intended to do at the time of the operation, and if he was going to do the complete operation referred to by Dr. Reed, he would wait.

He thought the main point in the diagnosis was how much to do, and when to stop, when the patient had reached this condition.

DR. WILLIAM H. WATHEN, of Louisville, Ky., by invitation, in speaking of the operative treatment of appendicitis, agreed most heartily with the assertion that every case should be operated when diagnosed. This was not only based upon what we had heard and read upon this subject, but upon his own personal experience and observation. A great fault in delay was the fact that just when the appendix ruptured, or when it became gangrenous, very often the temperature declined to normal; the pulse likewise went down to normal, and it was thought the patient was progressing well. The delay, therefore, was so great that it was too late to do the patient any good. He had recently had several cases of this class upon whom he had operated, with perfectly normal pulse and normal tem-

perature, with either rupture of the appendix, or a gangrenous appendix, all of whom made prompt recoveries because the operations were done early. He believed in inflicting as little traumatism as possible to the tissues.

He had not for ten years used irrigation in his abdominal work, believing that he necessarily produced traumatism that impaired the resistance of the epithelial structures and probably washed away the protection naturally existing—the phagocytes. Therefore, he believed in operating as quickly as possible after the diagnosis was made, irritating the stomach as little as possible, and draining the patients thoroughly where he had the purulent variety of infection to deal with. The question was, What should we do when there was a purulent accumulation? This was largely a question of individual equation. Each man must treat the case in hand according to the conditions that existed. He believed in making as thorough an operation as possible, consistent with not producing too much traumatism. The infected area should be removed, particularly where the surgeon could go on the inside to the left of the appendix beyond the infected area, walling off with gauze the infected location, and then if there was pus coming out of an abscess, the cavity could be protected from it, and we could by that means very often get rid of a large infected area and remove the appendix. It was ideal surgery to remove the appendix and cure the patient; but there were cases in which, if such surgery were attempted, the patient would be killed; where the best thing to do would be to make an incision, and if the appendix did not come into the wound properly, it should be let alone. If one manipulated too much to find the appendix, he would undoubtedly open the free peritoneal cavity and drain infectious material into it, which would probably cause the death of the patient; whereas, if one simply drained this area with gauze, the patient was likely to get well.

DR. HERMAN E. HAYD, of Buffalo, had made up his mind, after a good deal of experience with appendicitis, that we knew very little about the behavior of the appendix, excepting that if the surgeon did not get it out when it caused trouble, the patient would probably die. He had ceased to regard the pulse or the temperature in appendicitis. Only a few days ago, just before he left home, he operated upon a coal-heaver at ten o'clock in the morning. Previous to this he sat on his wagon and had delivered coal. His abdomen was greatly distended, filled with material, and the appendix was acutely gangrenous. The cecum was also gangrenous. The man died, and yet he had a pulse of 100, and a temperature of 99°. This was not an isolated experience. Every surgeon present had had a similar experience.

He agreed with the previous speakers, that cases of ap-

pendicitis should be operated upon early. It became largely a question of personal equation. If surgeons were honest with themselves they would soon learn their own limitations. One man could go into the abdomen and in fifteen minutes clean it out thoroughly, while another man could not go in and clean it out in half an hour, and still another one could never do it, yet he might be a professor of surgery in one of the too numerous medical colleges of the country. If it were possible to put one's fingers into the abdominal cavity and determine the limitation that existed there, if there was no secondary abscess, then he would be perfectly justified in retreating. But this could not be done. The surgeon must break up adhesions, and the man who did not go into the abdomen in a case of appendicitis and do this, taking out the appendix (he did not care whether the pus or abscess was localized or not), was inefficient. If he was skilled, he could take it out without inflicting much trauma.

He was willing to concede that he had learned a good deal from Dr. Murphy. He had told the members that he had experimented with the Ochsner treatment. While the speaker believed there was nothing in that treatment, still Dr. Murphy had persuaded him, by reason of his personal experience with the Ochsner treatment, where the danger of late operation for appendicitis existed, and that was in tearing open many unnecessary adhesions and of doing much unnecessary harm. We should do as little injury as possible; we should get into and out of the abdomen as quickly as possible. This was the secret. It did not matter how one treated the stump; they all got well. It did not matter whether one invaginated it or cut it, or touched it with carbolic acid, these patients would get well, if one operated early enough. Many patients did well in the late stages, if the surgeon did not do too much harm.

DR. HUGO O. PANTZER, of Indianapolis, called attention to a differential point that would indicate the difference between a case that was getting well and one which was not getting well, as in the case cited by Dr. Reed. He ventured to say, that the rectal temperature in every one of his cases would have shown two or three, and perhaps more, degrees of elevation above that of normal in patients who were apparently getting well, but who still had the elements of danger within them.

DR. MARCUS ROSENWASSER, of Cleveland, said that one point had occurred to him in connection with the discussion that had not been brought out. Dr. Price considered the appendix a cesspool for the collection of germs, and that it was simply a remnant of an embryonic state. If that was the case, every time the abdomen was opened the appendix should be removed, irrespective of whether it was found diseased or not. The question arose whether the healthy appendix should be removed, or an appendix that was in a physiological condition,

whenever the abdomen was opened for some other intraabdominal lesion.

DR. MONTGOMERY LINVILLE, of Newcastle, Pa., said this was the first surgical meeting he had ever attended where so many great minds were of one opinion, and he congratulated Dr. Price on the victory which he seemed to have won, in that for many years he had labored and fought for immediate operation in appendicitis. He had labored so earnestly and zealously, that many of his critics called appendicitis his great hobby. He was glad to see that he had lost his hobby, and that in the future he would have to search for another.

DR. A. M. VANCE, of Louisville, thought the keynote to the situation at present was to educate the laity up to the point of calling in a physician who knew what to do when a patient had something the matter in his abdomen. He had been practising surgery for many, many years, but he did not believe that he had been the first physician who had been called in a case of appendicitis. Usually some other practitioner had seen the case before he was called in. Now, one could not educate the people through such a practitioner. Appendicitis was a surgical disease, and the people should be taught the importance of that, and when they fully realized it, the surgeon would get these cases in time to save them.

DR. WM. M. BROWN, of Rochester, N. Y., called attention to a means of diagnosis and prognosis that was really more valuable than the temperature and pulse in appendicitis, and that was a careful, repeated differential white count.

DR. PRICE, in closing the discussion, said that all valued simplicity in their work. They liked to hear prominent operators and teachers who could give object lessons both in operating and in teaching. He was surprised that more surgeons were not jugglers. Dr. Senn and others, who returned from a trip to England years ago, after having seen Tait do operations, said they did not know whether he used silk or some other material, as he did his operations so quickly. Senn said that he slipped his two stubby fingers into the incision so quickly and removed the pathology so dexterously that he scarcely knew it was pathology. Tait did a large number of operations, and the onlookers scarcely knew how he did them. Tait was a juggler. It required great skill to make an incision, expose the pathology, remove it, and give others a picture of it as one saw it, and to make a proper toilet.

The title of the President's Address, delivered by DR. JOHN YOUNG BROWN, of St. Louis, was,

DIAGNOSIS AND SURGICAL TREATMENT OF INJURIES TO THE DIAPHRAGM.

At the request of the President, his Address was discussed.

DR. JOHN B. MURPHY, Chicago, was asked to open the dis-

¹See page 577.

cussion, and said that the Address was an epoch-making contribution in this line of work.

The fear of opening the chest was not as serious or as dangerous as we had been led to believe. The muscles which governed the action of respiration were not the costal muscles; these only influenced respiration in a secondary degree. When one side of the chest was opened, the septum should be immobilized, otherwise a vacuum would be produced. If we did not immobilize the septum by packing on that side, we would have a fibrous septum which would throw the lung out of action. Why? Because when the diaphragm came down, the septum would go over and flop to and fro so that there was no respiratory exchange. This should be guarded against, otherwise that condition of collapse so much feared formerly in these operations on the chest might occur.

DR. GEORGE W. CRILE, of Cleveland, said that the thorax, in connection with breathing, was now very much under the control of artificial methods, so that the surgeon could do almost what he wished with the methods of artificial respiration now in vogue.

DR. JOHN F. ERDMANN, of New York, reported two cases. One of them, a male, received a stab in the sixth intercostal space on the left side, penetrating the pleura, diaphragm, and puncturing the stomach. The stomach was herniated through the incised wound of the diaphragm, the opening of the diaphragm closed down on the stomach to such a degree as to prevent any leakage from the stomach into the peritoneal cavity, the stomach contents discharging through the chest wall wound from the pleural cavity. Patient died before operation.

The second case was a gunshot wound in a male, penetrating diaphragm, spleen, and kidney; while the third case was that of a male who received his injury in an obverse direction, penetrating the abdominal wall, then penetrating the diaphragm, and in its transit cutting the right coronary artery.

DR. JOHN B. MURPHY mentioned a case in which there was a hernia of the diaphragm, so that with the fluoroscope one could not only get an outline of the diaphragm, but could see the hernia very clearly.

DR. JOSEPH PRICE alluded to the neglect of early interference. After listening carefully to the reports of cases in which there were recoveries from operations, it would seem that in others in which death followed, delay was the cause. In other words, there were more extensive injuries in the cases that recovered than there were in those patients who died. And this brought him to the important point that early surgical work in these cases must be done if one expected to save them, whether the operation be done through a trap-door, the abdomen, or by the conjoined method. Most surgeons, he thought, preferred the conjoined method of manipulation, and he thought

Dr. Brown, with his advanced experience, would do the same hereafter.

Reference was made to gunshot and stab wounds being made at the sixth and seventh interspaces. Many of these people, when they were shot, were suffering from acute or chronic inebriety, and they were plunging shots or stabs, and it was a mistake to expect them below the fourth interspace. He had seen them all over the chest. He had seen four cases of stab wounds, and all four patients died. He saw these cases while he was a student and before he graduated. They were gunshot and stab wounds. If these patients were to be saved, they were to be saved as surgeons now save patients from gangrenous appendicitis—by early surgery, in the second and third, but preferably the first hour. Had some of the patients been operated early, before the peritoneal cavity was soiled with beer, sauerkraut, tripe, and cheese, they would have been saved; but they died of peritonitis. Instead of using small tubes, it was his opinion that if in some of the cases that were dying on the second or even third day, generous drainage had been instituted, some of the patients would have recovered even without putting in a stitch.

DR. BROWN, in closing the discussion, said that when a diagnosis of diaphragmatic hernia had been made, the proper method was to go through the chest. He advocated abdominal incision in acute conditions for the reason that if a hernia was present, it could be easily reduced. We could reduce an acute hernia, whereas an old hernia would require a great deal of time and patience to effect reduction.

In a great many of the cases that died from hernia, there were injuries of the diaphragm. The omentum blocked it, as was shown in a case that he had reported. The liver there acted as a barrier against hernia; but these patients died from peritonitis, the result of perforation of the bowel. Take a complicated case, as, for instance, a gunshot wound of the lung, liver, and kidney, or diaphragm and bowel, and the surgeon had complications to deal with that were beyond his power to save, and it was his belief that in all such cases operation should be undertaken. He had saved the lives of many patients who had received gunshot wounds, and yet whose cases at the time of operation seemed absolutely hopeless. They were shocked badly. They had liver wounds which bled freely. Usually, the cases that gave early symptoms were the ones that bled freely. Shock was the result of hemorrhage. Many cases that were badly wounded were seen, with multiple perforation of the bowel, that gave absolutely no symptoms.

CHRONIC DYSPESIAS RESULTING FROM PELVIC AND ABDOMINAL DISEASES, AND THEIR SURGICAL TREATMENT.¹

BY

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IN using the term dyspepsia, I am employing it with a comprehensive significance, since it does not represent any particular disease, nor is it the symptom of only one diseased organ. It is a complex term, and signifies a disorder of the processes of digestion. Various organs of the body are of necessity employed in this complicated function, and they can be disturbed, either as a result of disease in their own structures, or by reason of reflex irritations conveyed to them from other remote areas. The gastrointestinal apparatus is supplied and controlled in its functions by the great sympathetic system and its branches; and through its minute and complicated plexuses, all the other organs of the abdominal, pelvic, and thoracic cavities, which are contributory to the process of digestion and the subsequent elaboration of the food products, such as the liver, spleen, kidney, pancreas, as well as the genito-urinary and sexual systems. And so intimate and delicate is the association and connection of these many organs, through this intricate nervous supply, that irritations of one organ are transferred to the others, and symptoms referable to disturbed functions of one are often assumed and masqueraded by the others. Owing to this complexity and variety of symptoms, errors in diagnosis are necessarily made by all of us, but more frequently the more we limit our knowledge to some special organ and focus all symptoms from that organ. Moreover, it is possible for an individual organ like the uterus or kidney to be out of position, and yet produce no symptoms for many months and even years, or an individual may have a great many sources of reflex irritation acting all at the same time, as a retroverted uterus with a torn everted cervix; a floating kidney with its often associated chronic appendicitis, gall-bladder and rectal troubles; marked errors of refraction or

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phorias, and each may or may not be contributing in the symptomatology. If the surgeon has in mind the varied possibilities of reflex irritations, and works out those of peripheral origin with the assistance of other capable and honest specialists, too much will not be promised by any one procedure, nor will extravagant hopes be encouraged, and the opprobria connected with fruitless operations will be materially lessened.

Unfortunately, we have so few pathognomonic signs and symptoms in the practice of medicine, and anything which will throw light on any particular case must be utilized. Dr. Morris—one of our esteemed Fellows—published a very interesting paper in the May number of the JOURNAL OF OBSTETRICS, in which he pays special attention to tenderness upon deep pressure on each side of the navel—a point corresponding to the position of the lumbar plexus. He maintains that these two spots, although always more sensitive than the surrounding tissues, become hypersensitive to pressure upon both sides if the trouble be in the pelvis, whether in one tube, or ovary, or uterus, or all combined. If the appendix *only* be the seat of disease, *only* the right side of the navel will be oversensitive, and if the gall-bladder be involved, and even if there be extensive adhesions, there will rarely be increased sensitiveness, even on the right side of the navel. If the reflex irritation comes from the eyes, or ears, or nose or other peripheral areas, there will be no increased tenderness on either side of the navel. These suggestions are valuable, and if carefully studied, may be of great service in working out the details of some complicated case. I have been applying these tests for years and have often found them of great value.

Although not specially connected with the subject of my paper, let me allude to the rectum as a very prolific source of reflex irritation, and to the penis, and especially the deep urethra, because many forms of chronic and rebellious dyspepsias are cured by dilating a morbidly-contracted sphincter ani, or ablating piles, or curing an irritable ulcer or fissure, or by retracting a long prepuce, or performing a circumcision and meatotomy, and subsequently passing a cold steel round for hypersensitive deep urethral patches and stricture of large caliber.

Instead of presenting a series of many cases of dyspepsia cured by operations upon the abdominal and pelvic organs,

I shall simply detail the histories of a few cases which represent a group of many similar surgical experiences:

Miss V., æt. 35; seamstress. Complained of distress after eating and bloating in the bowels, and was excessively nervous. Also pain and uneasiness in the right side of belly and tenderness upon deep pressure. She had been wearing glasses carefully fitted by one of our best oculists. Her loss in weight during the past seven months was fifteen pounds.

Diagnosis.—Chronic appendicitis.

Operation.—Found a long, hard, closed appendix, at least five inches in length and with few adhesions. Left hospital on the twelfth day with a sense of perfect relief from her distressing stomach symptoms, and has remained a well woman.

Mr. B., æt. 26; floor walker in one of our large dry-goods stores; sent for me December, 1903, and complained of pain in the lower right side over the appendix. He was thin, nervous, and very dyspeptic, and had doctored with various men, and had taken various prescribed diets; in fact, was now on the Salisbury beef cure. He really looked like a consumptive; thin and haggard in his appearance.

Diagnosis.—Subacute appendicitis.

Operation.—Appendix soft, slightly inflamed at tip, and contained a cantelope melon seed. He had eaten no melon in eleven months. He gained rapidly in strength and flesh, and is to-day a well and vigorous man. How long the appendix contained the foreign body it is impossible to say, but perhaps months or even years.

Mrs. W., æt. 34; wife of a physician. Two children, youngest four years old. Came under my care July 28, 1904, suffering with marked dyspepsia. She had been treated by our very best stomach specialists. Her distress after eating was very great. She was excessively nervous and had lost over twenty pounds in weight. She had been dieted vigorously and was eating malted milk and zweibach when I first saw her. She had practically no pelvic symptoms—only a little backache at times.

Diagnosis.—Endometritis, bilateral laceration of the cervix, with much scar tissue; retroversion, cystocele and rectocele.

Operation.—Curettage, with Emmet's operation for cervical laceration; anterior and posterior colporrhaphy and perineorrhaphy, and an Alexander. She began to improve im-

mediately, and before she left the hospital was eating anything and everything, and weighs now one hundred and forty pounds, and is a well and happy woman.

Mrs. C., æt. 38. One boy 13 years old; no subsequent children and no miscarriages. In March, 1903, she consulted me and complained of distress after eating and pain and fullness in bowels and lower right side, extending into leg; insomnia and nervousness and heart symptoms; in fact, it was her cardiac symptoms which alarmed her.

Diagnosis.—Acute retroflexion, with slight adhesions of right tube and ovary, and a floating kidney, extending nearly to navel.

Operation.—March 12, 1903, curetted and removed, through a median incision, a portion of the right ovary and released a distorted and adherent tube and suspended uterus forward to edges of rectus muscle; the appendix was small and felt hard, but was not removed. Three weeks later did a nephropexia, and she left the hospital in four weeks. After being home a few days and moving about, she complained of pain in the lower right side, and one evening I was called because her distress was considerable. It was at once evident that she was suffering from a mild attack of appendicitis. The attack passed off and she did very well, but frequently she has had a good deal of pain in the right side, and in fact, is always conscious of some tenderness in the lower right quadrant and distressed with gas. She has gained thirty-six pounds in weight since the operations. I am satisfied had I removed the appendix when the abdomen was opened, she would now be a perfectly well and happy woman. Here is a case where all three conditions contributed to her suffering, and she remains an uncured woman because of my incomplete surgery. She is willing and anxious to go to the hospital to have the appendix removed, but her father objects to any more operations.

Miss H., æt. 39; seamstress, and a very intelligent woman. Consulted me on September 20, 1904, complaining of great pain and distress in the lower right quadrant, and marked dyspeptic symptoms. She had previously doctored with first-class stomach specialists, who also sent her to an eye surgeon, who gave her glasses.

Diagnosis.—Chronic appendicitis and floating right kidney. Retroversion.

Operation.—Through a median incision I removed a long, thickened and angulated appendix, which was slightly adherent to the bowels in the left side, and in it was a small concretion, and I also shortened the ligaments intraperitoneally. She improved in health and gained very much in flesh, and left Buffalo and took up her residence in Washington. After being there one year, she consulted Dr. Bovée for pain and distress in the lower right side, and went to the Columbia Hospital. He suggested an operation for adhesions, to which she objected, and returned to Buffalo. After studying her case a few weeks, I decided to perform a nephropexia, believing that her pelvic distress was reflex from her floating kidney, which was very loose and prolapsed. The operation was performed on May 25, 1906, and she left the hospital in four weeks. I saw her a few days ago when she was well, contented, and happy.

Mrs. B., æt. 62. Mother of five children, youngest 20 years of age. I was called to see her on December 3, 1904, and found her suffering great pain over the pit of the stomach, and upon pressure she was very tender. For years had been a terrible sufferer from dyspepsia, and had had attacks of vomiting of blood eight or ten years previous to this present illness.

Diagnosis.—Peritonitis, and perhaps due to duodenal ulcer or cancer.

Operation.—Found an hour-glass contraction of stomach at junction of middle and lower third. After slitting the lesser omentum and lifting up the stomach, there were a number of adhesions; in fact, everything seemed to be matted together. Upon separating the different structures, a perforating ulcer, closed up by these adhesions, was found on the posterior surface of the stomach, and close to the lesser curvature; a V-shaped piece was cut out of the stomach, which also took in the ulcerated area, and the walls of the organ were brought together with a double row of silk sutures, and a small drainage tube was left *in situ*. The woman did well until the fourteenth day, when the wound opened up and began to discharge first pus, and then food contents came through the opening. However, gradually the fistula contracted, but in the seventh week after the operation, when she was at home, she died of pneumonia. Here was a dyspeptic for years, and could only have been cured by surgical measures, yet she was permitted to go on suffering and was dosed *ad nauseam*.

Mrs. B., æt. 40, four children, youngest 6 years of age. Very healthy, vigorous looking woman. Never had jaundice, but for years had suffered from indigestion, gas in stomach and bowels, a sense of fullness and obstinate constipation. Vaginal examination negative. Upon palpation and deep pressure over region of gall-bladder, pain and tenderness were elicited and also the statement that frequently the pain over this region was so great that the pressure of the skirt bands and corsets could not be borne.

Diagnosis.—Subacute cholecystitis and possibly gallstones.

Operation.—March 10, 1902. Upon opening the abdomen, through a right lateral incision, the gall-bladder was seen full and somewhat distended, and its coats were thickened, but the glistening color was everywhere evident. After packing off carefully with gauze compresses, a big needle attached to a syringe was thrust into the bladder and a large quantity of a thick, dark, viscid, yellowish fluid was removed, and four large gallstones—two of them each the size of an olive. A drainage tube was placed in the gall-bladder and fixed, and the wound closed. At first the drainage was not good, but after four days bile flowed very copiously. The patient made a quick and satisfactory recovery and has been in fine health ever since the operation, and practically relieved of her distress and dyspeptic symptoms. This case serves to show that gall-bladder disease, and even stones can exist for years and be of large size and yet never cause any jaundice or very active symptoms, other than those ordinarily diagnosed as simple indigestion.

In this list, which I could have considerably enlarged upon by giving my experience with many similar cases, we have various pathological conditions, all capable of producing marked stomach symptoms, and ill health, and each case was treated for months, and even years for dyspepsia, and all were cured, and if not, were greatly relieved, by various operative procedures. They represent, moreover, a class of cases which were, up to a few years ago, considered purely medical, and were placed in the medical side of the hospital. They reflect, in strong language, the possibilities of present-day surgical practice, and in no small measure the great advances made in scientific medicine, and they serve to demonstrate and to suggest the still greater possibilities of surgical relief for many of the dyspepsias,

the result of true structural disease of the stomach, such as chronic gastritis with dilatation, gastric ulcer, with or without hour-glass contraction; thickening and narrowing of the pyloric orifice, early cancer when the possibilities of total removal exists, and many forms of pancreatic, duodenal, and hepatic disease.

It is hardly twenty years since the diseases of the lower right quadrant were fearlessly attacked by the surgeon, backed up by the pathologist, and that appalling malady, acute appendicitis, made benign under early surgical interference, and I believe in less time in the future, will the advanced and scientific physician turn over to the surgeon early in the course of the disease, all structural lesions of the stomach and bowels, as well as all the gross diseases of the liver, gall-bladder and pancreas for early rational surgical treatment.

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DISCUSSION.

DR. EARL HARLAN, of Cincinnati, by invitation, said that intestinal indigestion was a term which might be applied to a condition of chronic intestinal disturbance characterized by sour stomach, with occasional nausea and vomiting; indigestion; nervousness; general appearance of malnutrition and debility; billiousness; indefinite abdominal pain, with distress, anxiety, or discomfort, more or less constant; the persistent presence of an excess of stagnant gases at some certain apparently constant point in the bowel, with constipation or diarrhea. The presence of these latter symptoms usually concluded the development of one or other of the following conditions: Enteroptosis from general constitutional ailments; dislocations of single organs, as of the spleen, kidney, or prolapse of the anterior border of the liver, a condition which he recently had occasion to treat; diverticulitis, with mesenteritis; ulcer of the colon; the interference with the normal lumen and motion of the bowel produced by binding adhesions, as that of the omentum, or the deposition of lymphatic rings of constriction; appendiceal irritations and congestions which produced symptoms simulating those of appendicitis, and usually produced by dislocation of the kidney; ptosis of the cecum; uterine retroversions or adhesions about the pelvic organs; concretions in the appendix; the predeveloping stages of hernias; rectal hemorrhoids, or ulcer; or any pathological or mechanical condition within the abdominal cavity which would produce a partial obstruction of the bowel, which lesions constituted the true cause of the train of symptoms known as intestinal indigestion. Gross ailments and pathological changes

in the various thoracic and other viscera were excluded by differential diagnosis.

These cases, taken at the start and treated by a logical regimen of diet and methods of living, might be corrected. Left to persist for a long period under the causes which produced them, they resulted in lesions which might be reached only by surgical intervention. After persistent medical treatment had failed, surgical measures became necessary.

DR. ROBERT T. MORRIS, of New York, said the symptom of intestinal indigestion he looked upon as a cause, not a diagnostic entity. If a patient was suffering from intestinal indigestion, he said to him or her, "You have not intestinal indigestion, but a cough or a sneeze inside somewhere. What is exciting that cough or sneeze in your interior?" He would find out, and it was important to work the thing out right. One patient would have tremendous reflex trouble from a reflex peripheral irritation, while another would have no reflex symptoms at all. One woman would do a hard day's washing over a washtub, milk four goats, and do many other things with a condition that would send other women to bed as invalids. The cases must be classified. One should know what peripheral irritation was producing the cough or the sneeze inside of the patient.

DR. MORRIS referred to what he called his "pair of points." These points had reference to the lumbar ganglia, an inch on either side of the navel. If a patient had so-called appendicitis that was causing trouble, the right lumbar ganglion would be hypersensitive. If the trouble was due to irritation from the pelvis, both lumbar ganglia would be hypersensitive on pressure, and one could differentiate between a cirrhotic ovary and a cirrhotic appendix. With the latter the right lumbar ganglion was hypersensitive, and with the other both of them. In cases of adhesions of the gall-bladder, chronic cholecystitis, loose kidney, eyestrain, various common causes for disturbance, as a rule, neither one of the lumbar ganglia would be sensitive. So this pair of points was of extreme value in making a diagnosis in the office.

DR. EDWIN RICKETTS, of Cincinnati, was interested in one of the cases reported by the essayist of hour-glass contraction of the stomach. He was impressed with the prompt diagnosis of gastric ulcer which was so promptly removed by means of a V-shaped incision. He asked the essayist to speak of how the diagnosis was so readily made after the abdomen was opened.

DR. WALTER B. DORSETT, of St. Louis, referred to the hysterical type of gastric troubles. He mentioned a patient who was operated on for tubal trouble by Dr. Mann; afterward by a gynecologist in Philadelphia, and finally the woman came to St. Louis. She lived in a hotel there. She had a husband and a poodle dog, and frequently had hysterical sore throat. She

had been treated for stomach trouble, heart trouble, rectal trouble, etc. She came to his house and woke him up at 4 o'clock in the morning. He asked her what was the matter and she replied, "I cannot talk; I have lost my voice." He examined her carefully, but could not see anything the matter with her throat. He then poked his finger down into her throat and she went off talking. He thought in a good many of these cases that were relieved that the operations were suggestive, and that many of them that were supposed to have had lesions were really hysterical. He drew attention to this case, for the reason that in considering some of the cases reported by the essayist there might have been an element of hysteria associated with them.

DR. HOWARD W. LONGYEAR, of Detroit, said the abdominal-pelvic surgeon was liable to get into a rut by looking more for gross pathological lesions rather than getting good histories of his cases and giving proper prominence to symptoms. He should first be a good internal medicine man. He should have been a general practitioner, as that would lead him to look for these things and give them their due prominence.

He recalled a case he had which was reported in one of the earlier writings of Dr. Emmet. It was a case of extreme salivation. The woman was not only in danger of dying from this, but she had acquired the morphine habit because morphine was the only agent that would stop the salivation. She took increasing doses of morphine to relieve this. She had been doctored by various physicians without relief. She would spit up quarts and quarts of saliva daily. He examined her carefully and found a badly lacerated cervix which produced the salivation. As soon as the cervix was repaired the salivation ceased. Not only was the salivation cured, but before the woman got out of bed she stopped the morphine habit.

DR. RUFUS B. HALL, of Cincinnati, reported a case in contradistinction to the one described by Dr. Dorsett.

A woman, 38 years of age, the wife of a farmer, had distressing stomach symptoms. She had been treated for eight years, and finally the husband told him on the quiet that physicians had treated her principally as an hysteric. She thought she could not eat anything but patent foods. For six or seven years she weighed only 79 pounds, whereas her former weight was 130. She was the mother of two children, the youngest being 7 years of age. He went over the case carefully, and made up his mind that she had an enormously dilated stomach; she did not have a tumor in the region of the pylorus to account for this. After questioning her he felt justified in opening the abdomen. He learned that a year before her stomach symptoms began she vomited several times suddenly, and once or twice vomited blood, but not since then. He opened her abdomen, and found a very narrow opening at the pylorus, so

that he could not pass a lead pencil through the pyloric end of the stomach. There was a great deal of cicatricial tissue. He made a posterior gastroenterostomy early in June of this year. He saw the patient less than a week ago, when she informed him she now weighed 134 pounds. Her hysteria was all gone. She was able to eat all that other people ate.

DR. J. HENRY CARSTENS, of Detroit, said he had always maintained that the profession knew less about hysteria than it ought to. It was not easy to make a differential diagnosis between real hysteria and pseudo-hysteria. He had seen cases of dyspepsia repeatedly that were due to some form of eyestrain, and he had cured most of them of their dyspepsia by having their eyes fitted with proper glasses by some competent oculist. The general practitioner frequently forgot the great influence of eyestrain on the general system.

There were a great many chlorotic girls, and many of them had ulceration of the stomach which did not manifest itself very markedly. They went on for two or three years, and gradually their environment improved, or they left school and did not work so hard mentally, and the ulcers healed. After that the cicatrices began to contract, as all cicatrices did, and finally these girls had stenosis of the stomach. They rode bicycles; they exerted their muscles; their appetites were good; they ate large quantities of food, but the stomach was not able to expel its contents, and the result was dilatation of the organ, and the dilatation went on from one stage to another. With their stomachs in this condition they consulted a gastroenterologist, who inflated the stomach, and found that it came down to the symphysis. This man either washed out the stomach or gave a simple remedy. As they were not relieved, they would consult other gastroenterologists, who did the same thing, and as long as the patients had money they would continue to treat them while it lasted. Such patients were treated year after year without a correct diagnosis ever having been made in many of them. These men were treating these patients year in and year out, without knowing what was the matter with them. This was not only bad practice, but he regarded it as outrageous. When a patient was said to have dyspepsia, stomach trouble, or some chronic affection in the abdomen which these gastroenterologists could not diagnose and could not relieve, then it was time that they be turned over to an abdominal surgeon, who would open them up and be able to tell more about their real condition in five minutes than all the gastroenterologists could with their inflations, their electric illuminations of the stomach, etc. The abdominal surgeon would not only be able to tell what the trouble was, but in nine cases out of ten he could, by a simple operation, relieve these patients and restore them to health.

DR. JOHN B. MURPHY, of Chicago, said that every time

he made a diagnosis of neurasthenia, hysteria, malaria, he said to himself he did not know what was the matter. This was exactly what it meant, and when one of these vague cases came into his office late in the afternoon, he was not capable at that time of analyzing the case which deserved the closest and most careful attention. If physicians were going to continue to satisfy the people who consulted them, they must relieve them of their symptoms, and not give their symptoms a particularly new and pleasing name. One should arrive at the physical cause for the symptoms. He thought there was needed another class of surgeons that could relieve patients symptomatically of what other surgeons had left uncured. He did not say this sarcastically, but said it because he was painfully aware of the fact that physicians were neglecting to do certain things; they were neglecting to protect and relieve the cases which the essayist had mentioned. Even in operations sometimes the surgeon did comparatively crude work, in that he left exposed areas of peritoneum, and the patient returned after a time suffering more from adhesions than from the original trouble. He cited the following case, which impressed him.

A patient came to him ten years after a double oophorectomy, suffering from gastric trouble. As he could not make a satisfactory diagnosis, he resorted to an exploratory laparotomy. He found a pyloric zone of the stomach adherent to the pedicle of the left ovary. He thought he must have left an exposed zone there to have caused that adhesion. This brought him to the point that in the next five years one of the keystones to good surgical work was going to be the avoidance of adhesions to the abdominal viscera. Surgeons would do operations in the future which would prevent adhesions and fixations to abdominal viscera which disturbed the reflex actions of that entire plexus.

DR. JOSEPH PRICE, of Philadelphia, said it was scarcely necessary to substitute a new class of surgeons to excuse the reprehensible neglect of the pure clinician. The clinician had always asked too much of the surgeon. He was not willing to censure surgeons who had taken patients, perhaps in the eleventh hour, and relieved them of their pathological burdens; nor was he willing to accept the charge of the clinician as a just one, who would say, "I have given you these patients, and you turn them back to me in a worse condition than they were before operation."

These patients were neurasthenics, hysterics, chronic invalids. They suffered from nervous prostration, so-called, and had lost anywhere from three to thirty pounds in weight. In these cases the surgeon would find actual lesions; he would find adhesions; he would remove the pathology with good results in some, notwithstanding some of these patients had been told by good clinicians that it was dangerous to undergo operations.

Dr. Price cited the case of a woman of great wealth and prominence, who had received the opinions of several prominent men. She had received thirty-five propositions as to what it would cost her for an operation. She was told that an operation would kill her; that she might die on the table, and ought not to undergo an operation. He told her that she had a trouble that could be easily remedied. She consented to an operation. He removed a tumor about the size of a cocoanut, and she made a nice recovery.

DR. HAYD, in closing the discussion, said in presenting his paper, he felt he was dealing with one of the most complicated problems in the whole domain of medicine and surgery, and just so soon as surgeons recognized their inability to diagnose these cases properly, just so soon would they have the respect and confidence of general practitioners.

He believed that errors of refraction or affections of the eye muscles were the cause of more irritation than any other organ he knew of in the body. It was possible for men like Gould and Ranney to do a lot of good. They had done lots of good in these cases. Many cases of so-called dyspepsia had been cured by properly fitting glasses.

In reference to the remark of Dr. Ricketts, he would say that he made a diagnosis of perforating ulcer of the stomach simply from tenderness and fever. He knew he had a case of localized peritonitis. He assumed it was probably a duodenal ulcer or cancer, as the woman was nearly sixty years of age. He knew it was a case for operation, and found the condition he had spoken of after opening the abdomen.

INTESTINAL OBSTRUCTION DUE TO GALLSTONES, WITH A REPORT OF TWO CASES.*

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(With two illustrations.)

GALLSTONES may cause obstruction of the bowels directly or indirectly. They do so directly, by plugging or corking the bowel. This form of obstruction, which is the most frequent, may be caused by one large stone or by an aggregation of smaller stones held together by mucus or feces. The term

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obturation, therefore, best describes the form of obstruction of the bowels most frequently caused by gallstones. Indirectly gallstones may produce intestinal obstruction in five different ways:

- (1) By intestinal paresis due to peritonitis.
- (2) By the production of volvulus.
- (3) By the production of stricture of the bowel.

(4) A stone not sufficient in size to block the intestine of itself may cause contraction of the circular fibers of the gut upon the stone so as to produce complete occlusion; or such a stone may form the nucleus of an enterolith which may produce obstruction. Enteroliths found in this way are, according to Dennis,¹ the "bodies which most frequently cause acute obstruction."

- (5) By producing angulation of the bowel.

This classification differs from that of Mayo Robson² and others, but is borne out by a study of reported cases, and is believed to be better.

Peritonitis having its origin in gallstones and causing paralytic ileus usually originates in the region of the gall-bladder, but may originate in any other part of the abdominal cavity occupied by intestine. The infection atrium is caused by trauma of the intestinal wall produced by the stone. Volvulus may be produced by violent peristalsis due to gallstone colic or to the passage of the stone along the intestinal canal.

Stricture of the bowel due to gallstone may be extrinsic or intrinsic. The former is the more common and is due to peritoneal adhesions. They are most common in the vicinity of the gall-bladder, but have been found in other parts of the abdomen also. The latter are due to cicatricial contraction following ulceration produced by the stone, and are formed in the neighborhood of the gall-bladder. I have been able to find no report of intrinsic stricture of the gut save those due to the ulceration liberating the stone from the bile passages, and therefore in the liver region. However, that such stricture formation may occur in any part of the intestinal tract is more than probable, as ulceration at the site of temporary impaction of the stone in the bowel with subsequent onward movement of the stone has been noted several times. In a case reported by Le Conte³ that part of the gut in which the stone had first lodged was found to be gangrenous at the time of the operation, although the stone had passed lower down.

The frequency with which enteroliths are formed about gallstone nuclei is probably underestimated. Czerny as quoted by Lobstein⁴ "claims that obstruction rarely occurs until the stone has passed into the pelvis and formed there an angulation of the intestine." Reported cases prove this statement entirely too sweeping; however, there can be no question but that angulation is an important factor in gallstone obstruction of the intestine.

In a goodly number of cases two or more causative factors are found, no single one of which is, in itself, sufficient to cause complete obstruction. Gibson⁵ who found that four per cent. of all intestinal obstructions were due to gallstones, is probably nearer the actual fact than is Lichtenstern⁶ who found 41 cases due to gallstones out of a total of 1,553 cases of obstruction from all causes.

As gallstones are more commonly found in females than in males, so obstruction of the bowel from gallstones is more common in women than in men. It is perhaps as near the fact as we can get at the present time to say that from 75 to 80 per cent. of these patients are women. In 30 cases, in which the sex is given, tabulated for study in preparation of this paper, the proportion of females to males is 4 to 1. It will be noted that the relative frequency of gallstone disease in the two sexes agrees quite closely with the relative frequency of gallstone obstruction of the bowel in the two sexes, that is, in each, four or five females are affected to one male.

Brinton puts the average age at 53.5 years, Wood⁷ at 59.85 years. This practically agrees with an average made from all cases thus far reported. In my own data, above referred to, the average age is 60.32 in 28 cases. That most of these patients are past middle age is accounted for by two facts, (1) that it takes a long time, probably years, for a gallstone sufficiently large to produce intestinal occlusion, to form, and (2) that cholesterin is more abundant in the blood of elderly people. In the vast majority of cases the stone producing the obstruction enters the bowel by way of an opening formed by ulceration between the gall-bladder and duodenum. Passage of stones by ulceration from the gall-bladder into the colon is not uncommon, but stones passing this way seldom produce symptoms of obstruction because of the large caliber of the colon. Rarely they ulcerate through the gall-bladder into the stomach,⁸ less rarely into the jejunum.

That stones sufficiently large to produce obstruction of the bowel may pass through the common duct is unquestionable, Da Costa and others to the contrary notwithstanding. Moynihan⁹ cites two such cases. I have on two occasions removed stones, as large as the ones found in two cases herewith reported, from the common duct near the duodenum. That these stones may have grown by accretion after their lodgment in the common duct is true, but they demonstrate the fact, however, that the common duct may dilate sufficiently to lodge a stone large enough to cause occlusion of the bowel. Rokitansky and Tyson both say that stones the size of a hen's egg may pass through the common duct.

The small intestine gradually grows narrower as it approaches its junction with the cecum, which accounts for the fact that gallstones producing obstruction are most often found lodged in the ileum, and usually in its lower portion, although they may lodge in any portion of the intestine below the opening of the common duct. A relatively large number have been found in the ileocecal opening.

Tupper¹⁰ and Meisel (quoted by Moynihan) each record a case in which the stone was found between the opening of the common duct and the pylorus. Several have been found in the sigmoid flexure. Naunyn¹¹, quoted by Wood, reports a case in which the stone obstructed the bowel immediately above the sphincter ani. Mikulicz¹² (quoted by Moynihan) saw a case in which the duodenum was obstructed by pressure of gallstones lying in a diverticulum of the cystic duct. Treves's statement, therefore, that the obstruction is always in the small intestine is now known to be incorrect. I have been able to find but one case in which the point of entrance into the bowel was given wherein the obstruction was the large bowel. This is a case reported by Smith¹³. The stone entered the colon and lodged in the sigmoid. It is extremely probable that in all cases in which the large bowel is obstructed by a gallstone, the stone enters the colon. For it is extremely unlikely that a stone which passes through the small intestine would produce obstruction in the large. It should be remembered, however, that such a stone might, after entering the large bowel, become the nucleus of an enterolith which might produce occlusion. The size of the stones causing obstruction varies. Small stones have caused fatal obstruction and large ones have been passed without

symptoms. Often the obstruction is due to a clumping of small stones. This was the condition found in fifteen of the ninety-two cases collected by Lobstein in his paper above referred to.

Conditions Produced by Lodgment of Gallstone in the Bowel.—In the majority of cases operated upon, no serious damage to the intestine or mesentery is found. Le Conte, Bircher¹⁴ and Scott¹⁵ all report cases in which resection of the bowel was necessary because of gangrene. Kinnier (Mayo Robson) reported a case in which gangrene of the gut and mesentery was found post mortem three days after enterotomy had been done for the removal of a large stone. Relatively speaking, this is a large number of cases of gangrene and emphasizes the necessity of early operation. Douglas¹⁶ says that the stone may form for itself a diverticulum after which the symptoms of obstruction may pass. He thinks this is a rare incident. Personally I can find no such case reported.

Perforation is not uncommon in fatal cases, but the gut is usually found in good condition in cases operated upon promptly. Peritoneal adhesions also are seldom seen except in the less acute cases wherein symptoms have existed for some time.

Symptoms and Signs.—Previous symptoms of gallstones were given in 17 of Lobstein's 92 cases. An examination of the reports of 43 cases shows that in 17 there was a previous history of gallstone disease, in 3 it was stated that there had been no such symptoms, and in the remaining 20 this point is not referred to. Douglas, Hemmeter,¹⁷ Mayo Robson and Moynihan are in accord in the opinion that in the majority of cases there is history of previous gallstone disease, hence I am inclined to the opinion that Wood is incorrect in the statement, in his paper above referred to, that a history of previous attacks of gallstone disease is wanting in the majority of cases. A tumor was felt in 6 of the 43 cases analyzed by me. In one¹⁹ a tumor was felt in the umbilical region, in one²⁰ in the right hypochondrium, in one²¹ a mass was felt per rectum, and in two^{22 23} there was found a tumor in the right iliac region. Wising found a tumor noted in 5 of 51 cases collected by him. In a case reported by Elsner¹⁸ there was a tumor at the pylorus. After fifteen months, symptoms of bowel obstruction appeared suddenly, when the pyloric tumor was found to have disappeared. Later a tumor of the upper abdomen appeared. Eight days later a large stone was passed per anus and recovery followed. Fitz, quoted by

Hemmeter, found a tumor in 5 of the 23 cases compiled by him, one in the right iliac, two in the umbilical, one in the left inguinal region, and in one it was found by rectal examination.

The symptoms vary considerably with the variations in the exact character and location of the obstruction. Generally speaking there are the well-known symptoms of the obstruction of the bowel, either acute, subacute or chronic. In the majority of cases the symptoms may be said to border on the subacute variety rather than the hyperacute. The higher in the alimentary tract the obstruction occurs the more severe are the symptoms as a rule.

The pain is colicky and paroxysmal, less severe than in cases of volvulus and invagination except in those rare instances in which strangulation occurs in connection with the obstruction. The obstruction is quite frequently not complete. Often some gas is passed and in rare instances some feces. In a few cases diarrhea has been present. Vomiting is perhaps the most prominent symptom and becomes fecal if the obstruction persists. The abdomen is usually soft, and tympany is absent or but slightly marked in most cases. Tenderness and rigidity are not present unless there be peritonitis, hence their presence indicates that the obstruction is paratic in character, due to peritonitis, or that ulceration, volvulus or gangrene complicates the case. Shock is usually present at first, but not severe as a rule, although it may be, especially if the obstruction is high up. The symptoms may disappear permanently, or they may disappear for a time and then return.

The stone may be passed per anus without the patient's knowledge, or it may lodge in the large bowel and produce no symptoms for years. A long period of time may elapse (ten years in my own case) between the gallstone symptoms *per se* and the symptoms caused by the presence of the stone in the bowel. The stone may remain in the bowel for weeks or months without producing symptoms. It is probable that the entrance of the stone into the intestine is often not announced by symptoms.

MacLagan (quoted by Moynihan) records a case in which there were four distinct attacks of obstruction of the bowel followed by the passage per anus of four large gallstones. Two or more attacks of obstruction do not always mean two or more stones, though perhaps they usually do so. One stone may cause several attacks.

An exact diagnosis is not essential, and in the majority of cases cannot be made without an exploratory incision. In many cases, however, it would seem possible to arrive at a correct diagnosis prior to operation. A previous history of gallstone disease is significant, and while there may be no such history in many cases, it will be possible by careful inquiry to get a history of "stomach trouble" in the majority, and this so-called "stomach trouble" is usually in reality gallstone disease. It will be remembered that in most of these cases the gallstone producing the obstruction enters the bowel from the gall-bladder by ulceration and hence it is that in the majority there is no history of jaundice. If the history of gallstone disease includes a tumor in the gall-bladder region which is not present when the symptoms of obstruction appear, or which, at this time, is found to have migrated, the diagnosis of gallstone obstruction may be made with certainty. A migrating tumor, even in the absence of previous symptoms of gallstone trouble, is of diagnostic value, and if the tumor be characteristic in size, shape and consistency (the size of a small egg, oval and hard), is sufficient to base a diagnosis upon. The obstruction, too, being often less than complete, may aid in making a diagnosis. Repeated attacks of bowel obstruction are more common in this than in any other form of obstruction, and are therefore significant when present. There is perhaps no form of bowel obstruction in which there is so little tenderness and tympany as in that caused by gallstones.

The pulse and temperature are usually slightly, if at all, disturbed. In cases seen before the shock passes the pulse will be accelerated and the temperature may be slightly depressed, while later on the pulse may be accelerated and the temperature elevated owing to the supervention of peritonitis. To recapitulate, the points of especial diagnostic import are:

1. A previous history of gallstone disease, often called by the patient "stomach trouble."
2. Incompleteness of the obstruction.
3. Relative absence of tenderness, tympany, rigidity, and fever symptoms, especially early in the history of the case.
4. Persistent and frequent vomiting.
5. Tumor in the gall-bladder region preceding the symptoms of obstruction, but not present with them.
6. A migratory tumor, especially if it appears first in the gall-bladder region.

7. A tumor, even though stationary, of characteristic size, shape and consistency (*vide supra*).

After all is said and done it remains true that the best way to make an exact diagnosis in bowel obstruction, of any kind, is, in many cases, yes in the majority, by opening the belly. Because this fact is not generally accepted and acted upon, many unnecessary deaths have occurred and they will continue to occur until it is accepted and acted upon, hence no apology is made for this slight digression.

Prognosis.—That many cases of obstruction of the bowel by gallstones recover through passage of the stones *per vias naturales* is true, and it is a pity. A pity, because of the delay in operation which the knowledge of this fact has caused has resulted in the loss of more lives than have been saved by the passage of the stone.

Notwithstanding the spontaneous recoveries and those due to operation the mortality remains high. Mayo Robson says that 52 per cent. of all cases treated medically die and that surgery has not as yet shown a much greater percentage of recoveries. Treves says that 65 per cent. of all cases will die if not relieved surgically. Fitz (quoted by Hemmeter) says that of twelve cases treated medically eight recovered, and of eleven treated surgically but two recovered. This quotation from Fitz is a striking example of the fallaciousness of facts and figures when taken without a grain of salt. It is more than probable that all of the eleven cases cited by Fitz as having been treated surgically, had been treated medically until surgical interference was thought to be the only hope. It is equally probable that the two that recovered after operation would have died had they not been operated upon. In my own collection of cases there are eleven that were operated in which the time of operation was given. Five of the eleven died, and six recovered. The average duration of the obstruction prior to operation in the fatal cases was six and one-fifth days, and in those that recovered three and one-half days.

Treatment.—It seems strange that there should be any material difference of opinion as to the best plan of treatment to adopt in the malady under discussion, and stranger still that this difference should be found to exist among surgeons, but it is nevertheless true.

Sands²⁴ questions the propriety of early operation in acute

intestinal obstruction. Maylard,²⁵ speaking of obstruction by gallstones, says "treatment should in the first place consist of purely conservative measures." He advises large enemata and massage under chloroform to be followed by administration of belladonna and opium; "should these measures fail to give relief," he says, "the question of delay, or the immediate performance of enterotomy, has to be considered."

Douglas²⁶ says "efforts should be made to dislodge the stone by high enemata and judicious massage. Should these fail, enterotomy should be resorted to without delay." Hemmeter²⁷ also advises delay in operating. Waring²⁸ advises medical and palliative treatment in the early stages of the obstruction. Without prolonging the discussion by further quotations of this kind I submit that as long as such advice is followed, so long will the high mortality which now obtains from this malady continue. Rolleston, although an internist, hits the nail squarely on the head when he says,²⁹ speaking of gallstone obstruction, "as the symptoms are those of intestinal obstruction and it is seldom possible to make a certain diagnosis of mechanical obstruction of the intestine by gallstone, the safest course is to open the abdomen and remove the stone by incising the bowel."

I fully agree with Mayo Robson when he says "that the surgeon who waits beyond the period when an operation may be undertaken with every hope of success is incurring a very serious responsibility." I believe that nine-tenths of the surgeons of wide experience in this class of work will endorse Moynihan³⁰ when he says "operations performed during the first three days would probably have a mortality little, if at all, in excess of 10 per cent." Personally I believe that the mortality could be reduced to 5 per cent. if operation were done as soon as the diagnosis of intestinal obstruction was made.

Reports of Cases.—The reports of two hitherto unpublished cases are appended. That of Case I was kindly furnished me by Dr. R. E. Brokaw of Portland, Ind., in whose practice it occurred; that of Case II, by Dr. S. D. Beavers of Decatur, Ind., by whose courtesy I was called to operate.

CASE I.—"Mrs. Josephine B., æt. 44, mother of ten healthy children. A large woman, weighing 185 pounds. Always had good health and was a hard worker. About seven years before her death had severe paroxysms of pain in epigastrium. Had several paroxysms lasting from a few hours to two or three days

during the next three years, one very severe attack a few weeks prior to childbirth. During last two or three years of her life she had several severe attacks of pain and took morphine by hypodermic injection for relief. Her last sickness began about two weeks before her death—a very severe and prolonged attack, the pain becoming less until two days before her death, when the pains in the abdomen were severe, accompanied by vomiting and inability to move bowels. Death occurred October 27, 1905, from obstruction of the bowels. Autopsy revealed obstruction of the bowel about six inches above ileocecal juncture caused by impaction of large egg-shaped calculus; gall-bladder obliterated and replaced by adhesions to intestine which was fragile and easily torn. My opinion is that at the beginning of her last

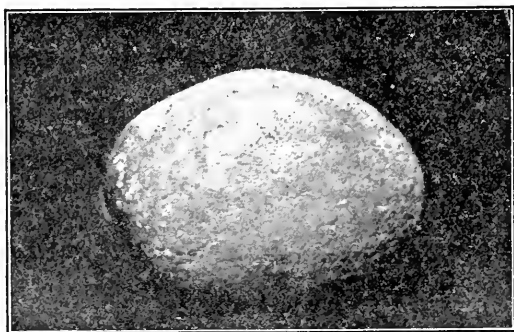


Fig. 1.—Stone Found in Case I, Natural Size.

sickness, two weeks before death, this stone ulcerated through gall-bladder into intestine-duodenum.” (See Fig. 1.)

CASE II.—“Mrs. C. G., 55 years of age, of German birth and mother of three grown daughters, was always healthy until October, 1894, when I was hastily summoned to see her, and found her cramping and vomiting. Her stomach was very tender, liver enlarged, and in region of gall-bladder was a tumor the size of a man’s fist. Gave morphine hypodermically and all pain stopped within a few hours. I advised operation, but as there was no further trouble and she and her husband were opposed to operating, my advice was not followed, and I saw nothing of her again until March 20, 1905, when she came to my office for relief of “stomach trouble.” Upon examination the stomach was found to be very tender, and the gall-bladder

region was so excessively tender I could not tell whether the former tumor existed or not. March 24 I was called again to see the patient and found her suffering from cramps in the stomach and region of the gall-bladder, but I was unable to discover former tumor although able to manipulate the parts freely. I again quieted cramps with the hypodermic. I now saw her at frequent intervals until June 24, 1905, when I was called and found her vomiting, with a history of no movement of the bowels for two days, stomach tender and slightly tympanitic. Her bowels were soft and not tender. Muscles of the abdomen relaxed. I ordered enemas repeated every four to six hours until bowels moved, and gave morphine hypodermically, which quieted her.

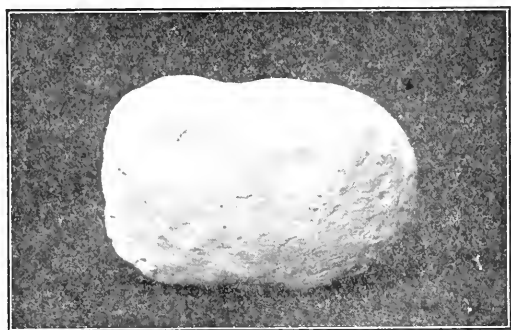


Fig. 2.—Cast of Stone Found in Case II, Natural Size.

June 25, I found that her bowels had not moved. I then ordered Rochelle salts, a heaping teaspoonful in hot water every two hours, but the salts only made her vomit. The stomach was now considerably distended by gas, abdominal muscles were rigid, and indications of obstruction of the bowels seemed unmistakable. I therefore advised operation, but the family objected. Next morning at 3 A.M. I again saw the patient and insisted upon an operation, to which they now consented. Called Dr. Porter of Fort Wayne, Ind., and Dr. Boyers of Decatur, Ind.

Dr. Porter operated at 9.30 A.M. and found a gallstone lodged in the ileum. The stone was about the size of a small hen's egg. The patient made a very rapid recovery and in sixty

days was doing general housework and was helping her husband about the farm.

The operation consisted of an enterotomy through a mid-line incision in the abdomen and was done at the patient's home, with the assistance of Doctors Beavers and Boyers. The stone was found to be tightly held by the bowel and was removed through an incision parallel with the long axis of the gut, while the escape of bowel contents was prevented by the fingers of the assistant. The opening in the bowel was closed by a through-and-through running stitch of catgut over which was placed a row of Lembert stitches of fine linen, the bowel was then cleansed and returned to the abdomen and the wound closed in the usual way without drainage. Not being permitted to keep the stone I made a cast of it, from a photograph of which the illustration (Fig. 2) was made.

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- 207 WEST WAYNE STREET.

DISCUSSION.

DR. A. M. VANCE, of Louisville, had seen two such cases. He did not diagnose either one of them; neither had any surgery done, and both patients got well.

He was called by a fellow practitioner to see a woman, 50 years of age, in the last degree of extreme emaciation. He found she had vomited every morning a large quantity of fluid for over a year. During that time she had complained of great pain in the abdomen, which had shifted in the last two days to the lower abdomen. She was out of range of surgical interference then, and his idea was that she had cancer of the pylorus. He advised palliative treatment, and also enema, hoping there would be some relief of the lower bowel and relief from pain. There was some impaction from the history given because she had had no evacuations recently. He thought the case was absolutely hopeless; but three days later the woman passed a foreign body with the feces which looked like a large Irish potato. It proved to be a gallstone, three inches long, and an inch and a half in diameter. She recovered.

Dr. Vance reported another case in a woman, 55 years of age. In this case he found considerable tenderness in the right iliac fossa. He thought she had appendicitis. There was very little fever. He manipulated the abdomen a little, and in a short time the woman passed a gallstone as large as a ping-pong ball, which he had dislodged by manipulation.

Dr. HUGO O. PANTZER, of Indianapolis, cited the case of a woman, 50 years of age, who was the subject of gallstones in early life, with frequent attacks during the first ten or fifteen years, but in later years she was free from such attacks. When seen by him, she gave a history of recurrent partial obstruction of the intestine, without change in location. The symptoms invariably were referred to the right hypochondrium. There was tumefaction in that locality. On opening the abdomen the gall-bladder was found adherent to the transverse colon, and it was during the efforts of nature to establish adhesion between the gall-bladder and transverse colon that these attacks occurred. There was a spastic contraction in that part of the colon at the hepatic flexure, which gave rise to intermittent obstruction. The obstruction was relieved and the patient made a good recovery.

SOME POINTS IN THE DIAGNOSIS AND TREATMENT
OF ACCIDENTAL HEMORRHAGE.¹

BY

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(With two illustrations.)

ACCIDENTAL hemorrhage is one of the most complex subjects in obstetrics, and one of the causes of its complexity is the word hemorrhage. In medicine and surgery we consider certain hemorrhages, such, for instance, as one in the brain or pancreas, dangerous because of the resulting clots which act as foreign bodies, and by irritating pressure, produce serious effects. In obstetrics most practitioners consider that the serious condition in all forms of what is technically known as accidental hemorrhage is loss of blood.

My aim in this paper is to refer simply to certain points in connection with accidental hemorrhage without any attempt to treat the subject in a complete or systematic manner. In a paper on the concealed variety read at the meeting of the British Medical Association last month, I reported a case of the concealed form. I may say that four cases of concealed accidental hemorrhage have come under my observation.

As these cases are exceedingly rare, I take the liberty of repeating one report of great interest, because I had the opportunity of watching the patient carefully from the onset of the serious symptoms until the time of her complete recovery.

Patient, aged 29, II-para, when seven months advanced in pregnancy was suddenly seized with abdominal pain while driving. Went home (only a short distance) as soon as possible. Went upstairs intending to go to bed, collapsed while undressing. I saw her in about twenty minutes and found her cold and weak, pale, with rapid pulse, and suffering intensely from "tearing" pains over the abdomen. Gave her large doses of morphine and ordinary treatment for shock. The symptoms, although very alarming for about two hours, sub-

¹Presented at the nineteenth annual meeting of the American Association of Obstetricians and Gynecologists, held at Cincinnati, September 20-22, 1906.

sided. Concealed hemorrhage suspected at first, but doubted on following day. Four days afterward an uneventful labor resulted in the expulsion of a dead fetus. The placenta showed evidence of being nearly half detached. The shock was evidently due to the tearing pains caused by the sudden impingement on the uterine wall, and not at all to the loss of blood, which did not amount to more than a pint (I think less than a pint). The clot thus produced, although comparatively small, had acted as a foreign body, and produced a surgical traumatism which nearly caused the death of the patient.

In considering the whole subject of accidental hemorrhage, several differences of opinion are prevalent, both as to diagnosis and treatment. The following procedures are conspicuous in this regard,—rupture of the membranes, plugging the vagina, accouchement forcé, and Cesarean section. In this paper vaginal Cesarean section will not be considered as a variety of accouchement forcé. Why is there so much divergence of opinion? In the first place, probably because the internal concealed variety is absolutely different from the external hemorrhage as to symptoms and results, and requires entirely different treatment.

Again, all accidental hemorrhages are at first internal and concealed, and present a great variety of symptoms, such variety depending on the suddenness of the outpour, the amount of blood poured out, and the length of time of concealment. The blood poured out from the ruptured vessels may flow freely from the uterus at once, or may be bottled up for a varying time.

In a certain proportion of cases of accidental hemorrhage there is little or no shock, because there is little or no obstruction to the flow of blood. The important condition here is loss of blood resulting in collapse, with no tearing or agonizing pains.

What is shock? We have no time now to discuss such an important subject in detail, but we recognize the fact that the surgeons of to-day are giving us valuable instruction as to this condition. Obstetricians have said much about shock as produced by accidental hemorrhage during the last sixty years. Many of their statements have been rather vague, but they generally indicate that shock, in connection with accidental hemorrhage, is a condition produced by loss of blood. It will

simplify the matter somewhat from the standpoint of this paper to leave out of the question what is known as post-operative shock. I shall, however, give a definite meaning to the two words, shock and collapse, although it will be admitted that any distinction between these two conditions must be to a certain extent artificial.

Shock will be considered a condition which is produced more or less suddenly by a serious traumatism, or surgical injury, similar, for instance, to that produced by the wheel of a railroad car passing over and crushing a limb.

Collapse will be considered a condition caused by extreme exhaustion, especially that induced by severe hemorrhage, and depending on the amount of blood lost. It is, of course, difficult in many cases to differentiate between these two conditions. It may be that we have shock from traumatism and collapse from hemorrhage to an equal degree in certain cases of concealed hemorrhage.

In the majority of cases of concealed hemorrhage, however, shock and not loss of blood is probably the prominent symptom or condition. The muscle of the uterine wall is generally strong enough to resist the impact of the *new body* without appreciably stretching, while the nerves suffer from the sudden pressure to such an extent that a severe storm arises, causing agonizing pain, intense shock, and tetanic spasm of the uterine musculature, with a cervix "as hard as iron."

There is another entirely different class of cases where the uterine wall is not strong enough to offer much resistance, and as a consequence the uterine cavity enlarges greatly, allowing an escape of blood from the uterine vessels sufficient to destroy life. I have not seen, nor have I met a physician who has seen such distention of the uterus, but we must accept the evidence of such careful observers as Oldham of Guy's Hospital, and others who have recorded such cases.

It should not be difficult to recognize such a condition because the patient would steadily grow worse, the abdomen would become enlarged, the temperature would be lowered, but the pulse rate would grow more rapid.

Diagnosis.—No attempt will be made to deal fully with the important subject of diagnosis. We may consider that, in many cases of the concealed, combined internal and external, and the ordinary external varieties, diagnosis is often difficult

or impossible for a time at least. The diagnosis of the concealed form is often impossible until after delivery.

In my paper of last month I referred to a very admirable discussion on accidental hemorrhage at the meeting of the British Medical Association two years ago. I can hardly agree, however, with the opinions there expressed respecting the diagnosis of the concealed form.

Sir Arthur McCann expressed the opinion that in many cases the diagnosis is impossible until after the expulsion of the placenta; but he adds: "However, once the symptoms of anemia are well marked, and are accompanied with much pain and tension or localized swelling, there is usually not much trouble about the diagnosis."

Jellett, who expresses the latest views from Dublin, tells us the symptoms of concealed hemorrhage fall under two heads: (1) "Those due to loss of blood;" (2) "those due to the accumulation of blood in the uterus." He adds that "the most prominent symptom in the second grade consists in the gradual enlargement of the uterus." Similar views are generally entertained in the United States and Canada. Whitridge Williams tells us,—“The appearance of acute anemia with manifestations of shock in a patient in the latter months of pregnancy should always suggest the concealed uterine hemorrhage.”

While it must be admitted that acute anemia and uterine distention are sometimes present, it seems certain that in a case such as I have described, there is no acute anemia or marked distention of the uterus. Therefore, these two symptoms to which so much prominence is given by many, if not by most authors, should receive less consideration in such cases.

What, then, are the symptoms of concealed accidental hemorrhage? They are probably in the majority of cases pain and shock. Pain generally comes on suddenly—so suddenly sometimes that it resembles the "solar-plexus punch" that "knocks out" the prize fighter. The pain is so entirely different from the ordinary labor pain that the patient and her friends generally realize that something serious has happened. The pain is continuous instead of being intermittent, amounts to extreme agony, and is accompanied by tetanic contraction of the uterine walls, including both body and neck. These symptoms should lead us to suspect that concealed hemorrhage is the possible or probable cause of the patient's condition.

Of course, one may be mistaken, as the following case will show: Mrs. A., aged 25, II-para. In the eighth month of pregnancy was suddenly seized with extreme continuous pain, accompanied with tetanic uterine contraction, July 24, of this year. When I saw the patient I suspected concealed accidental hemorrhage. Morphine was injected and the woman was at once sent to a private hospital, where she received a second dose of morphine and suitable treatment for shock. On the following day there was some local tenderness over the abdomen, with slight elevation of temperature, and catarrhal appendicitis was then suspected. In addition to the administration of morphine, the patient received calomel and castor oil, and recovered in about eight days (no signs of labor appearing in the meantime), and was sent home. On the last day of August labor commenced. She returned to the private hospital and, after a somewhat tedious labor, a healthy child was born September 1. The patient made a good recovery. Careful examination of the placenta revealed no trace of "old clot."

Although one may make a mistake in diagnosis in such cases, the prompt and appropriate treatment of pain and shock, or in other words, the treatment of symptoms according to the methods of many able obstetricians of fifty or sixty years ago appears to be correct.

Treatment.—In the paper on the concealed variety, reference was made to Goodell's extremely valuable and interesting paper on the same subject. This distinguished obstetrician described in a very graphic way the symptoms, but he did not, in my opinion, properly differentiate between shock from traumatism and collapse from loss of blood; and, as a consequence, his advice in such cases, "to deliver the woman as soon as possible," impelled men to carry out very radical forms of delivery with disastrous results.

The following is a synopsis of the treatment I have recommended when traumatic shock is the chief factor.

1. Administer morphine by hypodermic injection: one-half grain at once, one quarter grain in half an hour after, and another quarter after another half hour, or less, if required; *i.e.*, one grain within an hour. Atropine may be given as well, if thought advisable.

2. Lower the patient's head and elevate the foot of the bed.

3. Keep up the body temperature by the external application of artificial heat.

4. Give a high enema of salt solution. Subcutaneous or intravenous injections may sometimes be advisable.

5. Give small doses of strychnine (not more than two doses, of one-thirtieth of a grain each, by hypodermic injection).

The latter recommendation is given with some confidence, notwithstanding the adverse views of certain surgeons. I believe at the same time that large doses of this medicine are exceedingly dangerous in certain cases of either shock or collapse.

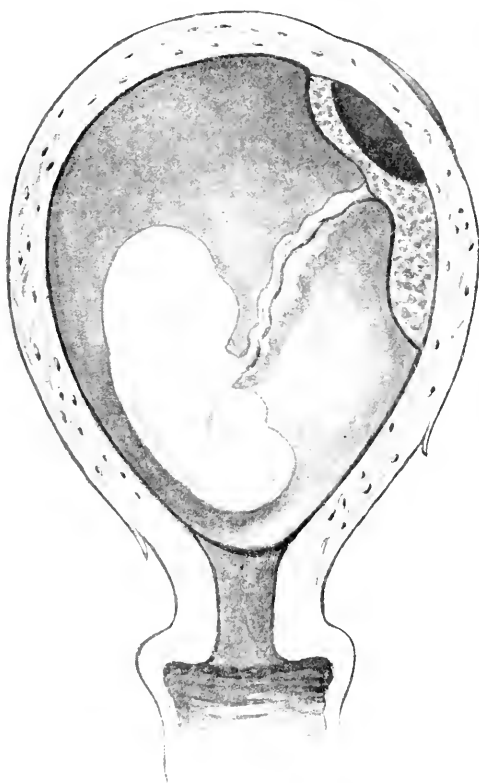


Fig. 1.—Pregnant uterus, seven months, membranes intact, uterine wall tetanically contracted cervix "hard as iron," showing a post-placental clot between a portion of the placenta and the uterine wall.

In the discussion which followed the reading of my paper at the Toronto meeting, it was stated, "that the same results could be obtained in many different ways. In Dublin the practice was to plug the vagina; in Edinburgh to rupture the membranes."

I had no opportunity to reply, but I desire now to call attention to the fact that in one of the cases reported (which is also reported to-day), the clot resulting from the outpour of blood, was entirely post-placental, the whole margin of the placenta being adherent to the uterine wall (Fig. 1). Neither the vaginal plug nor the puncture of the membranes could in this case mitigate the serious symptoms of pain and shock.

The combined internal and external accidental hemorrhage, whether occurring before or during labor, is more easily diagnosed than the purely concealed form; but in certain cases, the diagnosis is sufficiently difficult to cause much perplexity. When, for instance, a quart of blood is retained internally, and only two ounces escape externally, we have a condition closely similar to the concealed variety, with intense pain and shock. Under such circumstances it seems reasonable to suppose that the pain and shock are still the prominent symptoms, and should receive very prompt treatment. After complete or partial recovery from pain and shock it would seem well to carry out

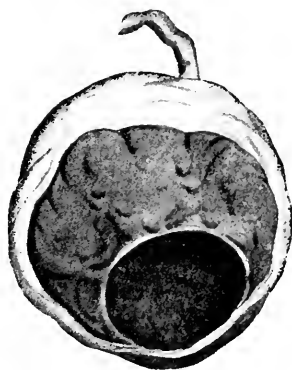


Fig. 2.—Placenta from Fig. 1, after delivery, showing on the maternal surface the saucer-shaped cavity occupied by the clot.

the so-called Dublin treatment to which further reference will be made, or perform a vaginal Cesarean section. A report of a case with similar conditions and symptoms will be given later.

In what is known as the external accidental hemorrhage, there is little or no shock, but there may be collapse from loss of blood. It is probably in such cases that the greatest difference of opinion prevails, especially as to two procedures, rupture of the membranes, and the introduction of the vaginal tampon.

The puncture of the membranes and the use of the plug are very old procedures in the treatment of accidental hemorrhage.

We are told that one hundred and thirty years ago there was a great difference of opinion on this question, and at that time Leroux of Dijon was a strong advocate of "rupture of the membranes," and the "administration of ergot of rye to check the flooding."

The discussion as to these two methods during the first and second thirds of the last century were interesting, and were equal in many respects, and perhaps better in some respects, than the discussions of the last forty years. It would appear from the discussion last month in Toronto that we have not made much progress in a century and a half as to the proper estimate of these two procedures. There can be little or no doubt, however, that each method is good in its proper place.

All things considered, the vaginal plug appears to be more generally useful, and safer, for the various kinds of accidental hemorrhage than any other procedure. And yet, a candidate at a final examination, who expressed such an opinion before a board of examiners in London, England, ten years ago, would probably have been plucked because of such dangerous heterodoxy. That terrible danger of converting an external into an internal hemorrhage was ever present for many years in the minds of the orthodox.

About twenty-five years ago, Spiegelberg and Smyly re-introduced the use of the plug, and England and Scotland were for a time horrified. The results at the Rotunda have been so remarkably good that the whole world has been forced to modify its opinions respecting the procedure. No one pretends, however, that such introduction of a plug is always safe; but it is understood that the proper application of an abdominal binder greatly minimizes the dangers.

It is difficult to understand, at the same time, how plugging could accomplish much good in concealed accidental hemorrhage, although we are told that in three cases of this form of hemorrhage occurring at the Rotunda, a plug was used with good effect. I do not know how the diagnosis was reached in these cases, nor when the plug was introduced; but I should suppose that such introduction would be absurd while the patient was suffering, perhaps dying, from shock.

If I should again meet a case similar to that which I have reported in which severe pains came on four days before the on-

set of labor, I should now be inclined to interfere after the patient had rallied, say on the day after the advent of the acute symptoms. After such a severe nerve storm as I have described, with its prolonged condition of uterine tetanic spasm, a fetus is, so far as I know, always dead.

Although I believe that the statement made by Goodell, that in such cases the rule should be imperative "to deliver the woman as soon as possible," has done a large amount of harm, by encouraging the operation of accouchement forcé, even while the cervix is "as hard as iron," yet I believe that the patient can hardly be considered safe until the uterus is emptied. I think, therefore, when all symptoms of shock have disappeared, it might be well to introduce a bougie into the uterus, according to the Krause method (being careful not to rupture the membranes), and at the same time introduce a plug into the vagina. This can be done best by using some form of Sims's speculum, introducing a gum elastic or rubber bougie, about 12, English size, as far as possible, and packing the vault of the vagina with antiseptic gauze. I prefer 5 per cent. iodoform gauze.

It seems remarkable that rupture of the membranes in cases of accidental hemorrhage should have had so many advocates during the last one hundred and fifty years. While one of the oldest, it is one of the crudest, and one of the most objectionable obstetrical operations when performed before the onset of labor. There is no doubt, however, that the procedure is an excellent one in its proper place, but its scope as compared with that of the introduction of the vaginal plug is much more restricted. In the case of concealed accidental hemorrhage before the onset of labor, and especially before the effacement of the cervical canal, it is, I think, never justifiable. In the case of the combined internal and external accidental hemorrhage before labor, one cannot speak so positively, but it seems probable that in such cases the operation is unjustifiable. If, however, labor has commenced and the external hemorrhage is serious, the rupture of the membranes will frequently, or perhaps generally, produce a good result by diminishing or frequently stopping the flooding. The puncture of the membranes may produce good results even if done before the onset of labor if there is effacement of the cervical canal. I have not however, had sufficient experience with this procedure to give a definite opinion in that regard.

It would not be profitable to spend much time dis-

cussing accouchement forcé. Its mortality rate, when the patient is suffering from shock, and the uterus is tetanically contracted is, in my opinion, exactly 100 per cent. I know of no operation in obstetrics or surgery respecting which one can speak more definitely. A certain amount of force may, however, be used when the os is dilatable. For instance, we may have ruptured the membranes before the os is dilated; there may still be considerable hemorrhage, making an early emptying of the uterus desirable. In such a case manual dilatation of the os, with version, or forceps delivery, may be advisable. It is doubtful, however, whether the manual dilatation, under such circumstances, should be designated accouchement forcé.

I should like to discuss the operation of vaginal or abdominal Cesarean section, but I have had no experience in connection with either operation for accidental hemorrhage. In the case of either concealed, or combined internal and external accidental hemorrhage, with the patient suffering from shock and a cervix as "hard as iron," any operation would probably be unjustifiable. The shock should be properly treated; and if, in spite of such treatment, the symptoms of shock grow worse instead of better, the patient is probably going to die. If, on the other hand, the patient recovers from the shock, it is certain that in some cases, if not in the majority, serious operation is not advisable. It might happen, however, that internal hemorrhage was taking place into a uterus whose walls were stretching rapidly, and the loss of blood was the chief factor. If, in such an emergency, it was not possible to dilate the os, and deliver soon enough to save life, some form of Cesarean section might be deemed advisable. Some form of vaginal section seems the best radical operation in sight; but I am inclined to think its field is exceedingly limited. It seems to me entirely unsuited for such a case as I have reported to-day, especially when there is doubt as to the diagnosis; but it may be indicated in cases where labor is imminent, or present, especially where loss of blood, whether internally or externally, or both, is the serious factor.

I shall now submit to the Fellows of the Association a case reported something like ninety years ago: "A lady of a weakly constitution and delicate habit, was attacked in the latter months of pregnancy with a slight discharge of blood from the vagina, not amounting altogether to half an ounce, accom-

panied with alarming symptoms of exhaustion and debility. The os uteri was scarcely dilated to the size of a sixpence, and was in such a state of rigidity as precluded the possibility of affording any manual assistance. The lady in consequence died, and, on examination after death, it was found that the separation of the center of the placenta from the parietes of the uterus had taken place, whilst its edges were completely adherent, forming a kind of cul-de-sac into which blood had been poured, to the amount of a pint and a half, which had become coagulated within the cavity thus formed."

What would you do in such a case as this? Did this woman die from shock, or from loss of blood, or from a combination of the two? I have never met a case where the loss of a pint and a half of blood without other complication caused death; but I must admit that such a hemorrhage is a serious matter. I think, however, that the rigidity of the os was due to that peculiar nerve storm which is present in such cases, and that the patient died from shock. Under such circumstances, my chief aim would be to first treat the shock as indicated. As to operative procedures I should like to get your opinions.

The main points of this paper are as follows:

1. Making a diagnosis in many cases of concealed accidental hemorrhage is generally difficult, sometimes impossible, before delivery.
2. The so-called important symptoms—*anemia* and *distention* of the uterus—are not present in a large proportion of such cases.
3. The serious condition in most cases is shock from traumatism, and not collapse from loss of blood.
4. The diagnosis of the combined internal and external accidental hemorrhage is more readily made, but the amount and effect of the blood within the uterus are often difficult to ascertain.
5. Even in such cases shock from traumatism is sometimes the predominating element; on the other hand, collapse from loss of blood, whether retained within the uterus or flowing externally, is sometimes the important factor.
6. In all cases where shock from traumatism is the main condition, or the predominating element, the most urgent requirement is proper treatment of such shock, and not emptying the uterus.

7. In a large proportion of cases of the combined internal and external hemorrhage, the introduction of the vaginal plug, with the application of an abdominal binder, appears to be a very safe and effectual plan of treatment.

8. In a small proportion of cases, especially during labor, puncture of the membranes is beneficial.

9. Any form of accouchement forcé, which includes forcible dilatation of a rigid cervix is never justifiable.

10. The best operative procedure would appear to be some form of vaginal section; but its field is limited, and not accurately defined.

30 GERRARD STREET EAST.

DISCUSSION.

DR. MILES F. PORTER, of Fort Wayne, Indiana, said that the effect of a given hemorrhage depended principally on two points, and in Dr. Wright's case they were well-nigh equal. The first quantity of blood lost influenced the time which expired in the losing of the blood. He mentioned the old experiment in the physiological laboratory of suddenly removing a few ounces of blood, thus producing death of the animal more gradually than by the removal of a large quantity, without producing any serious symptoms. He thought Dr. Wright's patient died of hemorrhage, and suggested that such patients be given saline infusion, which might stop the hemorrhage that was going on.

DR. OSCAR H. ELBRECHT, of St. Louis, in referring to the second case reported by the essayist, said it was one for immediate delivery, either by Dührssen incision or accouchement forcé. The puncture method was an old one, and perhaps the only one to determine whether there was intrauterine hemorrhage or not. There was no oozing usually from the cervix, and when there were symptoms of shock or hemorrhage, this was the only way. He had had cases in which there was intrauterine hemorrhage, and had seen three or four cases of placental detachment in which the women delivered themselves spontaneously.

DR. SIGMAR STARK, of Cincinnati, related the history of a case of accidental hemorrhage which he saw in consultation. The patient was taken with severe abdominal pain. The physician got there about three o'clock, and in an hour's time was enabled to make a diagnosis of accidental hemorrhage. The woman became worse, and at six o'clock the speaker was sent for. At the time of his arrival he found her abdomen greatly distended, and readily concurred with the attending physician in the diagnosis of concealed hemorrhage.

The woman was blanched to an extreme degree. Her pulse could hardly be counted. The heart beats ranged from 160 to 170. They determined, on account of the grave condition of affairs and believing there was hemorrhage going on, to induce labor. Accordingly, the woman was anesthetized, dilatation of the os was proceeded with, but labor did not set in absolutely until after the os was dilated, and it was a tedious performance. It took from one-half to three-quarters of an hour to dilate the os. Having ruptured the membranes, forceps were applied and the child delivered; but in fifteen minutes the woman was dead. This woman was brought to an extreme degree of exsanguination within a short time from concealed hemorrhage.

DR. WALTER B. DORSETT, of St. Louis, spoke of the causes of the placenta becoming detached from the uterus. *First*, we had an abnormally short cord, or a cord around the neck of the child. *Second*, we might have some pathological condition of the placenta itself. We might have a syphilitic condition of the placenta, or inflammatory changes in it.

As to the treatment, there was no time to puncture and wait, but all measures should be life-saving. The vagina should be packed tightly with the idea of controlling hemorrhage by compression of the uterine artery, tamponing alongside the neck of the uterus to stop bleeding, and if the loss of blood or shock was great, we should resort to intravenous saline solution. He treated two such cases along those lines, allowing nature to come in and deliver the woman naturally.

DR. E. GUSTAV ZINKE, of Cincinnati, said the treatment of accidental hemorrhage was very important. The pathology was of secondary consideration. What were we to do when we were confronted with a woman apparently dying of concealed accidental hemorrhage. The first thing that entered the mind was that the uterus must be emptied, and if it could not be emptied by the Harris or Edgar method, other methods should be tried. The Harris or Edgar method might be considered if the cervix was soft and dilatable. If it did not permit of rapid dilatation, it was a waste of time, and the woman would doubtless die before one got through with whatever method he might adopt for the relief of the unfortunate condition. If dilatation with the finger (either the Harris or Edgar method) was not possible, or improbable, if the child was viable, he would not hesitate to resort to vaginal Cesarean section, and one could do this operation even at the house of the patient without subjecting her to any serious risk, provided he knew how. If he did not, he should get someone who did as quick as he could. If there was obstruction to the natural way, then he would not hesitate to do abdominal Cesarean section, even under very unfortunate circumstances, for the woman was going to die. However, he would take his chance with abdominal Cesarean section under such circumstances if the natural passage was blocked from any cause.

In the case described by Dr. Wright, abdominal Cesarean section was indicated in his judgment.

DR. WRIGHT, in closing the discussion, said if there was one thing he wanted to stop in this country, it was the wave of accouchement forcé that went over it a few years ago. It seemed extraordinary in connection with the discussion of this subject that so much harm should have been done, and yet obstetricians clung to a certain thing because Dr. Goodell said so. Goodell wrote one of the most magnificent papers he had ever read upon this subject. He described the symptoms clearly from a series of collected cases, but seemed confused as to the difference between shock and hemorrhage. So far as the speaker had been able to form any opinion, he should say that vaginal Cesarean section was the best operation in cases of accidental hemorrhage. But he did not know when it should be done.

DIFFUSE PERITONITIS.¹

DR. JOHN B. MURPHY, of Chicago, reported thirty-six consecutive cases of general suppurative peritonitis from perforation, with one death. In treating this condition he emphasized the importance of relieving pressure and of instituting drainage, doing as little surgery as possible. The patient should be put in a sitting position both before and after operation, so as to keep the infective material out of the diaphragmatic zone. At the time of operation usually the patient had all the infection he could possibly carry; he was handicapped, and it was the duty of the surgeon to eliminate that infection or intoxication as much as possible, and in doing so care should be taken not to abrade another square inch or half of a square inch of surface so as to admit more infective material. The patient should be tided over for a few hours, and his local resistance built up by washing out the blood with normal salt solution. Anti-streptococcic serum should be employed. Little or no food should be given, as what hastened absorption of infective material in the diaphragmatic zone was peristaltic action.

DR. JAMES F. W. ROSS, of Toronto, Ontario, could not show as brilliant results as those given by the essayist, but still his results had materially improved. He presented a tabulated list of 62 cases of diffuse general peritonitis, and said that the first part of his record was rather appalling, in that in the first series of 30 cases, there were 26 deaths, and 4 recoveries; while in the last series of 30, there were 10 deaths, and 20 recoveries.

To what was this striking difference due? There were two factors. *First*, improved technic; *second*, earlier interference.

1. In his earlier cases he washed out, as he thought, thoroughly with gallons of sterile salt solution, but he found that with the intestines in the abdomen there was a great deal of handling and rubbing, and he considered this a mistake. Find-

¹Paper to be published later.

ing that removal of the intestines when necessary in looking for an intestinal obstruction was not accompanied by shock so long as the endothelial cells were kept bathed by warm saline solution, and the bowels were not allowed to become chilled, he decided to eviscerate patients suffering from diffuse purulent peritonitis. When the contents were removed the abdomen could be more thoroughly washed, as could the eviscerated contents, and there was less interference with nature's protecting lymph blocking up the lymphatic stomata. Two streams could be kept running from two douche receptacles, one cleansing the five abdominal pouches—post-splenic, post-hepatic, two iliac and pelvic—and the other cleansing the extraabdominal viscera. No matter what the pulse was, he went on until thoroughly satisfied, and then returned the viscera and closed the wound. He used no posture for the patient, and no drain for the peritoneal cavity. Why? His results spoke for themselves. A house surgeon asked him a question that influenced him relative to drainage. He had operated on a case and had put a drain into each loin from behind. The woman recovered, but within twenty-four to thirty-six hours there was no drainage. The interne said, "What is the object of trying to drain these cases—it seems that drainage ceases in such a short time?" Dr. Ross had not drained since except in one case, when the patient was practically dying from the effects of the hydrochloric acid that had been escaping from a large perforation of the stomach for hours before he saw him, and the operation was only undertaken at the patient's request. Even in a case of ruptured pus tube no drainage of any kind was used, and the wounds were completely closed. The wound often began to open even with buried silk sutures applied in layers, but when they opened even down to the intestines themselves, there was no drainage of fluid. He had also used frequent injections of saline solution under the breasts and hourly enemata of the same solution, injected well up into the rectum, with how much benefit he could not say. Perhaps, after a time, this latter might be again discarded. It did seem as if the salt solution had some effect. Unfortunately he had not as yet had the blood or urine tested to determine the presence or absence of any definite changes in their solid constituents.

2. *Earlier Interference.*—He said we were now better able to diagnose diffuse purulent peritonitis than we were a few years ago. The general practitioner called in the surgeon much earlier, and surgeons were allowed by the public to do about as they advised. Formerly it was, "Oh, we will wait until to-morrow;" now it is, "Why not attend to this at once?" The public had been educated, the profession had been and was being educated, and the work of the surgeon was facilitated.

In his list were twenty-two deaths; nineteen recovered, only after a terrible struggle, and he thought every one of these might have been saved by early operation. Those cases of perforation

without diffuse purulent peritonitis that lost their lives from profound sepsis were not included in the list. Perforation of the appendix caused diffuse purulent peritonitis in forty-one cases, and there were only twenty cases from all the other causes combined.

DR. MILES F. PORTER, of Fort Wayne, Indiana, referred to the question of a better technic, and said that there was a better word than that—namely, cut the technic short, let the pus out, let the patient alone, and he would get well. Such patients had been getting well under that management for the last fifteen years, and there were cases of general purulent peritonitis fifteen years ago the same as now. The Fowler position was a great advantage. Another advantage was the continuous rectal injection of water very, very slowly; but the greatest point of all, in his estimation, was to let the pus out and leave the patient alone. The man who took out the appendix in all of his cases would lose a patient now and then; whereas, he might save some of them by leaving in the appendix and by doing nothing more than putting in a drain. The same held true of other forms of peritonitis.

DR. JOSEPH PRICE, of Philadelphia, said that Dr. Murphy's methods of relief of pressure, molecular death, and pus foci were simple, in that he avoided the conditions which were known to kill. They were purely pathological. There were surgeons who obtained good results in these cases by going just as far as the pathology extended and removing it, but proceeding no further. He believed that when the toxins were diluted or removed, likewise the pus foci and all the elements that predisposed to the formation of pus, *i. e.*, when he arrested infection he saved his patient. In arresting infection he did so with some form of drainage precisely as Dr. Murphy arrested it with one, two, or three drains, and he believed with the open method of treatment which he practised in some of these cases, without stitches, that his patient was safer than the patient of Dr. Murphy with stitches, and with three rubber or glass tubes. Such a paper as Dr. Murphy's would stimulate surgeons to do cleaner work.

DR. JOHN YOUNG BROWN, of St. Louis, said that up to the time Dr. Murphy published two thousand cases of appendicitis, with general peritonitis, his own mortality was high in the character of cases under discussion. But since the publication of that paper he had used the method that had been advocated, and he had excluded those cases that could not be strictly called cases of general peritonitis. He had operated on twelve cases, with twelve recoveries. Two weeks before he left St. Louis, to attend the meeting, a man, a minister, was brought into the hospital at eleven o'clock at night. He removed his appendix, and as he had peritonitis, quarts of saline solution were given by the rectum, and he made a nice recovery. He had irrigated these cases. He had used gauze drains; he had flanked them

and drained them, and yet had never made any progress in the treatment of this condition; but since he had adopted the method that had been described by the essayist, his results had been highly satisfactory.

He emphasized the point made by Dr. Murphy that saline irrigations should be given properly, and when this was done, it was found that the amount of fluid that could be absorbed was simply remarkable.

DR. JAMES F. BALDWIN asked Dr. Murphy whether he included in the recoveries cases of general purulent peritonitis, in which extensive adhesions had formed, and in which there were multiple pockets or foci of pus; or cases of general peritonitis that had followed puncture of the uterus during the commitment of abortion, the cases having gone on for a week or more, and at the operation numerous cavities of pus having been found. In his own experience such patients usually died. He did not see how he could have saved them by the treatment which he had adopted in the last two years. Perhaps the lives of many such patients could be saved in the future by the method that had been described by the essayist.

DR. MURPHY, in closing the discussion, said that in his report he included every case of general suppurative peritonitis that had come under his care—good, bad, and indifferent, in that length of time. He had not, however, had just the type of cases which Dr. Baldwin had mentioned, and if he had had such, he would not include them under general suppurative peritonitis, as in these there were multiple foci of infection. Time was a precious element in operating on these cases. Extensive handling of viscera should not be done. No man could handle the peritoneum extensively without producing additional trauma and additional abrasions.

THE ABUSE OF PURGATIVES.¹

BY
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NOTWITHSTANDING the great strides the science of medicine has made in the last half century, entirely revolutionizing our views of pathology, we still cling to many of the vagaries of our fathers. It is true that great changes have been made in our therapeutics, and many gross errors have been abandoned; but there still remains in our recent text-books much that should have been long since expunged as harmful or valueless. We should at least break away from measures productive of harm.

¹Presented at the nineteenth annual meeting of the American Association of Obstetricians and Gynecologists, held at Cincinnati, September 20-22, 1906.

We have replaced emetics with the stomach tube and sudorifics by the use of dry heat and baths, and so on through the line, until the reliance on drugs in every division is less, or is replaced by a better remedy.

Less change has been made in the employment of cathartics than in any other department of therapeutics. We do not use them as heroically, it is true; fewer "are purged out of the world," but they still occupy the foreground of our armamentarium. A friend, who enjoys a large practice, in reply to my strictures against purgatives, says: "I could not practise medicine without purgatives." In fact, the very name of our profession emphasizes their use, for we practise "medicine" or "physic," which certainly encourages the laity in their belief that our chief reliance is in drugs and that "physic" means the "usual purge" his family doctor gives him, as a preliminary, in all his ills.

I wish we could find a better name, for we do not practise "medicine" to-day. The use of drugs has now and probably always will have an important place, but it is not our chief reliance, and as our knowledge advances, it will be of less importance. The laity should be educated to the idea that the prime object in consulting a physician is to obtain a diagnosis and to receive such directions of a mode of life as will best combat their trouble, and that the exhibition of drugs is of small importance compared to this.

A large proportion, and one might safely say, a majority of patients who consult their family physicians, get a dose of purgative medicine to begin with. The doctors give it because they are "bilious," or to "unlock the secretions"—whatever that may mean—or to "act on the liver," although we know but little of the functional derangements of that organ, and probably less of the action of drugs on it. It is not strange therefore, that people should resort to the purge themselves, for have they not the endorsement of the profession? Can we be surprised then that the use of these drugs is almost universal? I have often asked the question: "Have you any purgative medicine in the house?" And have yet to receive a negative answer. Is not this universal use of laxatives productive of much harm? Are we not after all responsible for most of it? I firmly believe that most of the advance made by Christian Science is due to the abuse of purgatives by our profession. The sufferer goes from doctor to

doctor, and either has these drugs prescribed, or at least no warning against them. Their continual use is, in many cases, their only trouble. They embrace "the faith," stop their purgatives, and are healed. Is it strange or unjust for them to charge that after years of "medical" treatment without avail, Christian Science has made them whole? There is nothing new about this, for there have been many warnings, we must admit, but alas they have not been heeded.

Robert W. Wells, Surgeon U. S. A. in 1828 (*N. Y. Med. Bul.*, Vol. I, p. 217), says: "Almost every writer and teacher of the present, on both sides of the Atlantic, appear to be infected with purging mania, and the various classes of medical students annually let loose upon the world, following implicitly the dictates of their masters, commence their careers with equally unsparing hands; and until calomel, jalap and gamboge be exhausted, there is little hope for ourselves and our posterity. They, too, will be purged out of the world, as their fathers have been before them."

Daniel Drake, in 1833 protested against strong purgatives and taught that they produced inflammation.

Dr. Hammond, as Surgeon-General of the Army, in 1863, issued an order striking calomel from the list of supplies, because its use resulted in more harm than good. Radcliffe, in 1865, and Atkinson, in 1873, exposed the evils of cathartics, and pointed out a more rational method of dealing with the ailments in which they were employed. Besides there have been repeated warnings by many writers to this time. All have doubtless done some good, but the fact remains that they are still employed as a routine by a large majority of physicians to-day, nor is this strange, for after a somewhat extensive review of the subject, I have found very few authors who do not countenance the use of purgatives in almost all diseases. Put it right home: how many patients with chronic constipation get away from you without a prescription for some laxative, to be used when "necessary?"

We must take a stand against purgatives, just as we do against narcotics. They are not to be used except when indications are clear, and only under the direction of a physician. They are instruments of evil to be avoided by them as much as possible.

One cannot but feel the necessity of greater light on the

physiology of the digestive tract. Our very ignorance should behoove us to be careful in attempting to modify processes of which we know so little. We know that stomach digestion takes about seven hours, the chyme passes from the pylorus to the ileocecal valve in three to five hours (Boas-Illoway). This is accomplished by movements which are quite constant, and the deviations from health affecting the motility of the small intestines is but little understood, and much that is written lacks scientific basis. We do know that the contents of the small intestine is fluid, from which nutrition substances are extracted. When it reaches the colon, the motion is slower, requiring about twelve hours to pass from the cecum to the rectum. In the colon the remaining nourishment and part of the fluid is absorbed, rendering the mass semi-solid, and is stored in the sigmoid until it is ready to be expelled. Feces do not normally remain long in the rectum. The average amount of feces in twenty-four hours is from four to six ounces; 75 per cent. of the bulk should be water. The amount and consistency in health varies according to the amount and kind of food taken. If meats, albuminoids and such foods as are nearly all absorbed, especially if the quantity taken be small, the stools will be hard, small and dry, and on the other hand, in vegetarians, or those who eat much vegetables, a mushy stool is not abnormal (Boas).

There is a practical agreement that the frequency of bowel movements may be from three daily to one in three days. The average civilized human being has one action daily, and this is considered normal by most writers, while intervals of more than three days is regarded as abnormal, still, there are many instances of longer intervals, in which the general health did not suffer. In disease, however, there are many cases in which little inconvenience is felt, although the intervals are much longer. Atkinson (*Edinburgh Med. Journal*, 1873) reports a case "where he feared hectic fever might come on if the strength of the patient were in any way lowered, he kept the bowels locked for one month, and the result was an excellent recovery." Treves says, "in several cases there was complete constipation for two or three months," who recovered health after bowels were relieved, and still longer intervals have been reported, all of which were distinctly pathological, but they show that in any condition there is no occasion for anxiety if the bowels fail to act for a number of days.

Our lack of knowledge of the physiological action of purgatives is also painfully evident. I tried to find the physiological action of salines, calomel and castor oil, the purgatives most commonly employed. The only thing I could thoroughly establish was that they are all irritants. Salines increase the amount of fluid partly by their affinity for water, and they diminish absorption, thus increasing peristalsis by distension of the bowels. Castor oil acts by its irritant properties (Butler-Biddle), while in the action of calomel there is a wide diversity of opinion.

H. C. Wood (1905) says: "The conclusion seems inevitable that mercurial purgatives given to healthy persons cause the escape of large quantities of bile from the alimentary canal."

Roberts Bartholomew (1904) says: "Experiments have shown that calomel lessens the physiological activity of the liver, and consequently diminishes the production of bile; instead of stimulating the liver or acting as a cholagog, calomel must be regarded as a sedative and as having the power to allay an irritable state of the liver. This fact harmonizes in a most satisfactory way with clinical experience, for calomel has always been regarded as useful in the highest degree in those cases of "biliousness" characterized with a surplussage of bile due to an over-acting liver. Hare says: "The question as to how calomel does act, whether it is changed by the alkaline juice of the intestines or whether it acts as calomel, or as mercury, is not settled."

Here we have two standard authors; one gives calomel to increase the flow of bile, the other to check it, and both expect to correct the "biliousness" by it. If these were the ravings of a backwoods doctor, we would pass them over without notice; but they are the teachings of the leading authorities on therapeutics to-day. Before leaving this part of the subject, I want to call your attention to the views of Dr. Groesbeck Walsh of Chicago. I quote the following from him (*American Medicine*, Vol. IX, pp. 945-947):

"The class of cathartics is the most varied of any in our materia medica, and though differing widely in strength and relatively in effect produces results which are strikingly similar and strongly suggestive of a common agency of force.

"All catharsis is accompanied by three phenomena: (1) liquefaction of feces; (2) increase in gas formation; and (3) the induction of increased peristalsis. All forms of mercury

with which we are acquainted are germicidal in action; all forms are cathartic in action.

"Mercurial catharsis is invariably accompanied by excessive gas formation, liquefaction of feces, and the induction of increased peristalsis, and differs only in degrees and duration from any form of microbe catharsis with which we are acquainted.

"*B. coli communis* is constantly present in the human intestine from the first taking of food until the death of the individual; it is the hardiest of all the intestinal bacteria, and will outstrip all other varieties under similar conditions of environment. Its excessive growth is marked by the same group of phenomena which attend the invasion of the intestinal tract by any of the pathogenic organisms, increase of gas formation, induction of increased peristalsis, and liquefaction of feces.

"The experiments of Strassburger have proved that the growth of the intestinal bacterial flora is encouraged by the use of mercurous chloride.

"The theory is advanced that mercurial catharsis is brought about by the promotion of the activity of certain of the intestinal bacteria. The results obtained by the use of the other cathartic agents so closely resemble the results obtained from the use of mercury that until definitely proved to the contrary, it would appear only reasonable to believe that they too bring about their constitutional effects by some similar selective action upon the intestinal bacteria.

"The recognition and the use of these facts are the first means afforded us for the establishment of a definite intestinal therapy and the removal of the whole subject from the field of empiricism where it has always laid.

"The probability is brought home to us that many of the intestinal infections are to be controlled not by attempts at destruction of the triumphant species, hitherto so unsuccessful, but by a destruction secondary to and dependent upon the restoration of the normal bacterial flora of the part."

This view is supported by the fact that feces of constipation contain much less than the normal proportions of bacteria, and show less evidence of decomposition when placed in an incubator (A. Schmit. Strassburger).

Johnson (*Am. Tex. Med.*, 1896) says: "In cases of many purgative substances, it would appear that, as in diarrhea due to specific poisons, the intestinal mucus membrane is irritated, an

excessive amount of epithelium is thrown off, and a pathological transudation from the blood-vessels occurs, as evidenced by the albumen which the liquid dejecta hold in solution; * * * in other words, every purgative is pathogenetic, and the repeated irritant effect of every purgative is to induce a diseased condition of the mucous membrane."

Roos treated constipation by giving live cultures of the colon bacillus. They had a laxative effect, while dead ones did not. While the evidence probably is insufficient to say that purgatives act always and exclusively by the increase of the bacterial action, we must admit that the argument is quite plausible.

It is not my purpose to discuss in detail the conditions in which purgatives are used; nor am I prepared to lay down rules for their employment. On the contrary, in view of our limited knowledge of the physiology of the intestines, and the pathology of their diseases, and diverse and contradictory conclusions, as to the physiological action of cathartics by the best authorities, from experimental and clinical observation, it seems to me that we are forced to acknowledge that the use of purgatives is empirical and as a further consideration of the fact we have abundance of evidence that they are capable of doing much harm. These considerations warn us against their promiscuous use. The public should be taught the danger of their routine use, and the physician should prescribe them with as much care and circumspection as our present limited knowledge will permit.

Constipation is the condition for which we most often prescribe cathartics, yet the best authorities condemn them, and all agree that they are a most fruitful cause of constipation, and in most cases do no good and in many do absolute harm. In spastic constipation, they are a most potent evil.

In diarrhea they are doubtless of advantage in some cases; but unless used with great caution, will greatly aggravate the trouble. The whole subject of their use as derivatives in diseases of the heart, kidney and brain, is vague, uncertain, and needs to be thoroughly restudied.

The employment of purgatives in the preparation of patients for surgical operations, especially on the abdominal viscera, and as a usual treatment for the complications following these operations, is almost a universal custom. So far as I have investigated, no one except M. L. Harris of Chicago (*J. A. M. A.*,

1905), has seriously questioned this practice, and our latest text-books and magazines endorse it.

He has pointed out the folly of their employment in peritonitis, sigmoiditis, obstruction of the bowels, and shows that they can only do harm.

Why should we give a purgative before a surgical operation? If the patient has fecal impaction, a purgative alone does no good. Jamison says, "where the colon is filled, an abnormal amount of watery secretions is forced by the drug into a foul canal to mix there with its contents, of which the major portion is returned and reabsorbed in the system."

In the normal individual there is no "loading" of the bowels, so the purgative is unnecessary. If the patient is the victim of bad hygiene, and feces is retained, it is in the colon and not in the small bowel. An enema will be of more service to mechanically free this viscus of the accumulation.

In other words, the vast majority of those who come for operations have no accumulation of feces in the colon; the small minority that do, have fecal impaction which purgation is powerless to relieve. Very few, if any of them, should be purged. For nearly two years I have not exhibited laxatives in these cases. If it was an emergency, an enema was used to empty the rectum and sigmoid. If the patient was several days under observation, a light nutritious diet was relied upon to put the intestines in the best condition. My results have been entirely satisfactory. The patients are not weakened or nauseated by the purge; they are in every way better prepared for the ordeal. When we first adopted this plan, it at once became apparent that patients suffered less with tympany. I have been trying for a long time to find a method to prevent this by diet, laxatives and intestinal antiseptics without avail. The nurses have noticed and reported a marked improvement in this respect, and that those cases that have been prepared before they came under our care by the "usual purge," almost invariably have more gas.

The routine use of laxatives after operations is entirely unnecessary. I am not prepared to say that they can be entirely dispensed with, for our patients come under our care too short a time before the operation to correct bad habits which have existed for years. In a large proportion of cases nothing whatever is needed. As soon as the patient begins to take nourish-

ment, the bowels will act. Reis recommends a full diet very early after operations, but this is unnecessary, as there is no reason to hasten the action of the bowels. I have often, where there are no unfavorable symptoms, waited for four or five days, and in one bad case of resection of the sigmoid, waited for eleven days for a spontaneous action of the bowels. These patients were quite as comfortable as those whose bowels were moved earlier. Where tympany is troublesome, a stimulating enema is given. The only objection that I found to leaving all to nature, is that in certain patients impaction in the rectum causes some inconvenience, but enemas will relieve this. The truth is, that if no complication (peritonitis, ileus) arise, the bowels will move in due time without interference. The danger is not enhanced if they should fail to act for several days.

No one would think of giving a drug to correct an obstruction of any kind. That is entirely a question of mechanics. For peritonitis in which no operation is indicated, purgatives do harm. The ice bag and opium and the withholding of everything by mouth give the best result.

My object in presenting this paper is to direct your attention to the abuse of cathartics, and to point out some of the evils which they cause. I do not claim that in the present state of our knowledge we can do without them entirely, nor that their judicious use is disadvantageous in some cases. I will, however, venture to predict that increased knowledge of our science will much curtail their use.

712 UPPER FOURTH STREET.

DISCUSSION.

DR. JOSEPH PRICE said that the administration of meat broths, sterilized diet, abundance of water, after operations was good practice, followed by some simple laxative. A simple laxative did not make patients bilious, but it would cause free bowel evacuations. It would reduce the mortality very much, and give both nurses and surgeons less anxiety. Take a hundred such patients, if the preliminary preparation was careful, and the surgery clean and satisfactory, the results would invariably be good.

DR. JOHN YOUNG BROWN said, with reference to the use of purgatives, that he had heard both the Mayo brothers speak of the virtues of castor oil. In fact, it was about the only drug they used in their hospital, together with salts. He had occasion to ask Dr. Wm. J. Mayo in regard to the after-treatment of his cases, and he made the remark that if, after an operation,

the patient was doing well, he was so glad of it that he left him alone. Dr. Brown thought that was excellent advice. Unquestionably, purgatives were used too often. He thought a great deal of good could be accomplished by high enemas, and in cases of abdominal distention after operation he had obtained excellent results by the use of alum enemas and the use of the gauze tube that Dr. Price employed in his work.

DR. OSCAR H. ELBRECHT, of St. Louis, said that eserin salicylate had been used with varying success by different surgeons after operation, but in cases of flatus he had employed this agent with excellent results in 75 per cent. of the cases.

DR. MONTGOMERY LINVILLE testified to the successful use of eserin after operations. He had employed it in three recent cases with great satisfaction.

DR. HUGO O. PANTZER endorsed what had been said with reference to the use of castor oil. It was an old-time remedy, and in his opinion had not been displaced by anything its equal.

DR. EDWIN RICKETTS had made observations and demonstrations relative to the action of calomel upon the liver, both to the satisfaction of himself and a number of his colleagues. After cholecystotomies had been done, the administration of calomel was resorted to, and there were decided beneficial effects from its administration each time.

DR. WALKER, in closing the discussion, said one of the principal objects in presenting his paper was to inject the thought that physicians were using cathartics too much.

A CONSIDERATION OF THE FACTORS WHICH HAVE LOWERED THE OPERATIVE MORTALITY AND HAVE IMPROVED THE POST- OPERATIVE RESULTS.¹

BY

X. O. WERDER, M.D.,

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THE deductions which are embodied in this paper, and are based on my own personal experience, are by no means new or startling; but some of them are perhaps not recognized by some of our surgeons to their full importance and they will, therefore, bear a free discussion by such an experienced body of men as are assembled at this meeting. They are of entirely practical nature and will be given without entering into any theoretical argumentation.

¹Presented at the nineteenth annual meeting of the American Association of Obstetricians and Gynecologists, held at Cincinnati, September 20-22, 1906.

To emphasize some of the points which I wish to bring out more particularly, it was thought advisable to give some statistical figures, especially regarding mortality, of my own work in pelvic surgery done during the last twelve years; it is unnecessary for this purpose to reach back beyond this time, as we would then get into a period when abdominal surgery had not reached its stage of full development.

All cases requiring abdominal section for some pelvic lesion in my service at Mercy Hospital during this period, *i.e.*, from 1894 to 1906, are herein recorded, and also the comparatively few operated on outside of this institution during the last two years. All these operations were performed either by myself or my assistant. As the field of abdominal surgery is a large one and necessarily greatly diversified, it was thought preferable to confine myself to abdominal operations for pathological conditions in the pelvic organs, particularly as my experience is more closely identified with this, *i.e.*, gynecological, line of work than that which might, in contradistinction, be termed general abdominal surgery. The cases are taken from the Mercy Hospital report, carefully compiled by an especially-appointed registrar and published bi-annually; they are, therefore, presented in series of two years, excepting those from 1896 to 1899, which form only one report. The work during the last two years, of which no report has as yet been made, has been especially looked up and classified for this purpose. The cases from 1894 to 1904, covering a period of ten years, merely serve the purpose of showing the operative mortality in each series for the sake of comparison, while the last series, from September 1, 1904, to August 15, of this year, will be utilized more in detail in the discussion of the various points brought out in this paper.

From October, 1894, to October, 1896, there were recorded 213 abdominal sections, with 20 deaths, or a mortality of 9.39 per cent. ($9\frac{3}{4}\%$ +). From October, 1896, to October, 1899 (three years), 403 abdominal sections, with 30 deaths, or 7.44 per cent. ($7\frac{1}{2}\%$).

From October, 1899, to October, 1900 (one year only), 165 abdominal sections, with 15 deaths, or 9 per cent. The average mortality during the first series of six years was, therefore, $8\frac{1}{3}$ per cent.

From October, 1900, to October, 1902, 392 laparotomies

were reported, with 11 deaths, or 2.8 per cent. From October, 1902, to October, 1904, 480 laparotomies, with 10 deaths, or 2 per cent. +. From September, 1904, to August 15, 1906, 598 abdominal sections, with 14 deaths, or 2.34 per cent. ($2\frac{1}{3}\%$ +).

During this second period of six years, there were, therefore, 1,470 sections, with 35 deaths, or an average mortality of 2.38 per cent. ($2\frac{1}{3}\%$ +) as compared with an average mortality of $8\frac{1}{3}$ per cent. in the previous series.

The difference is so striking and remarkable that the year 1900 may well be termed the beginning of a new era in our abdominal work, especially so since the result was not due to any passing streak of luck, as demonstrated by the fact that the lowered mortality rate has been maintained and even slightly improved ever since, nor can this be attributed to any change in our operative material, which has remained practically the same; it must, therefore, be due to an improvement in the treatment. In what this consisted cannot be explained in a few words, as unquestionably quite a number of factors contributed to this end. One of the most important has, no doubt, been a better aseptic technique.

Since the introduction of rubber gloves, there has been a marked improvement in aseptic results in abdominal operations, and their use has no doubt been a decided factor in the lessened mortality. While my assistants have been wearing gloves for a number of years, beginning ten years ago with Mikulicz's linen gloves, I myself was rather slow in adopting them, as I feared that they would seriously interfere with the skilled touch so essential to the pelvic surgeon. About this time, however, viz. in the year 1900, I began the systematic use of gloves for myself also, which I have continued ever since, and which I regard as the greatest and only safeguard for the patient against infection. It has given us the means of preventing infection with absolute certainty in clean cases, as shown by the record of our last 598 cases, in which there was not a single fatal infection in clean cases.

Asepsis was now used rather than antiseptis, and all preparations were made and are still made by a nurse appointed on account of her special fitness for this work, to which she devotes herself exclusively. The technique was simplified in such a manner that as few hands as possible are required; only

two assistants are used, one of whom is experienced, trained and absolutely reliable, devoting his entire time to this work. He stands opposite to the operator and also takes entire charge of the pads, for which he is held responsible. The other assistant looks after the instruments and sutures only. The nurses connected with the operating room have no direct part in the operations, and are, therefore, not required to sterilize their hands.

Another factor of no less importance, was a more careful diagnosis and better preparatory treatment, especially in inflammatory and septic cases. While heretofore many cases of this character were operated on soon after their admission to the hospital, in the presence of a daily temperature, or at least soon after it became normal, no inflammatory cases are now operated on until at least three weeks of a normal temperature have been reached. This plan is not always easy to carry out, as the patients usually feel so well by that time that they are difficult to persuade of the necessity of an operation; others become so impatient during the weeks of suspense at the hospital, that it takes the greatest amount of tact and persuasion to keep them in the hospital until their condition warrants operation. But I am convinced that many lives are constantly sacrificed by the too-early operation after an attack of acute pelvic peritonitis, and the longer an operation can be deferred after the inflammatory symptoms have subsided, the less we need fear a stirring up to renewed activity of the dormant pyogenic organisms, resulting, if not in a fatal septic peritonitis, at least in wound infection and more or less serious complications. In spite of all these precautions, six of the fourteen deaths in the last series of five hundred and ninety-eight cases were in just such cases from a septic peritonitis, proving the necessity of further delay in many of these cases.

A factor which perhaps does not receive the attention it deserves, in my opinion, is the advisability of doing your operative work as much as possible in one institution, in which you are master of your operating room, and have complete control of the personnel in charge, who will conscientiously carry out your technic in its minutest detail.

This arrangement centralizes the work for the operator who can devote more personal attention to his cases and super-

wise the after-treatment. He also keeps in better touch with the nurses under him, whom he can teach and instruct personally in matters most important for them to know. I believe it is to this centralization and personal supervision that the Mayos owe much of their success.

I am sure that it is largely due to this factor that I have been able to save the last four cases of intraperitoneal hemorrhage following abdominal sections. Had they been less favorably located and under less watchful care, their lives would no doubt have been sacrificed. There are other post-operative complications in which relief depends on prompt recognition and action, which is only possible when the cases are under your personal supervision, or that of an experienced assistant, trained in this line of work. It requires no little courage at times to carry out this centralization idea, because it is opposed not only by some of the patients, but what is more serious, by many of the physicians on whose patronage the operator depends, to a great extent. The patient can generally be won over by a clear statement of the advantages gained; but the physician whose motives are not always pure and unselfish is less open to persuasion. If you must operate outside of your own hospital, it should be done only with your own assistants, for reasons unnecessary to detail. One good trained assistant is an invaluable aid in an abdominal operation, and his services should be dispensed with only in emergency work when not within reach.

Another reason for our better results, was no doubt a more careful operation and better protection of the abdominal contents. The intestines in all abdominal operations are carefully packed away from the pelvis and covered with pads, so that they are usually neither seen nor touched during the active part of the operation; they are also protected from septic material, if such be in the pelvis. All raw surfaces are thoroughly and carefully covered up with peritoneal tissue, whenever such a course is feasible, and it usually is; this not only checks up all oozing, but also prevents adhesions and other undesirable complications. While we use drainage in some cases, especially septic cases, we do not let it take the place of a complete and thorough operation, and especially a restoration of the normal peritoneal coverings where such have been lost or displaced during the enucleation of the diseased structures.

Such careful plastic work, as it might be termed, in the abdominal cavity, takes time and patience, and the surgeon, therefore, should never be hurried and too fatigued. We should, therefore, never operate on too many cases at one time. Two bad cases in one morning are quite sufficient, and it is generally advisable to interpose some lighter work, such as plastic operations, which give the surgeon time to rest and to recover from the strain of the previous work. Instead of crowding my work together into a few operating days, as I formerly did, I operate every day, preferably in the morning, when rested and fresh, and when the patient also is best prepared for the ordeal.

In addition to the six deaths from septic peritonitis in the last series of five hundred and ninety-eight cases already mentioned, there were two others from septic peritonitis: one was an infected ectopic gestation, with extensive bowel involvement, and the other a case of cancer of the body of the uterus, far advanced, in which the vaginal route had to be abandoned for the abdominal, on account of the friability of the uterus. This case was also complicated by a nephritis previous to operation. There was not a single case of septic peritonitis following operation in cases not previously infected.

Of the remaining six fatal cases in this series, there were three sudden deaths from embolism, two pulmonary—an unusually large percentage in our experience—two from shock and hemorrhage within three or four hours after operation; one an intraligamentous suppurating ovarian cyst, the other a very difficult intraligamentous fibroid; this being the only death in the one hundred and eighteen cases of uterine fibroid operated on in this series. A case of chorion-epithelioma and dermoid complicating pregnancy of four and one-half months died on the twenty-third day after operation, from rapid extension and metastasis.

Of the complications occurring, I may mention four cases of fecal fistula, all of which, however, closed spontaneously before leaving the hospital, excepting one case of tubercular salpingitis and peritonitis. In addition to these, there were three cases of extensive suppuration of the abdominal walls, and fifteen cases of slighter wound infection. With the exception of the tubercular case, there was only one case leaving the hospital with an abdominal fistula, a pelvic suppuration case.

In this list are, of course, not included a number of slight, superficial skin irritations and infections, which healed up in a couple of days. We had, therefore, twenty-two cases of more or less serious wound infections, or $3\frac{2}{3}$ per cent., which goes to show that in spite of the greatest care in the preparation of the abdominal skin, we have failed in a number of cases to obtain a sterile operative field, a result not surprising, when we consider the difficult problem of skin disinfection.

By the use of catgut as the exclusive ligature and suture material in the abdominal cavity, except in intestinal surgery, the long tedious suppurating sinuses, so common in former days, have almost entirely become a thing of the past, as shown by the fact that we have had only one such case in almost six hundred sections. It has also practically done away with the stump exudates, which were so annoying to the patient and surgeon alike, when silk was used in the abdomen, often leaving the patient in as bad, if not a worse, condition than before the operation. The use of catgut must, therefore, be regarded as a great advance in abdominal surgery, especially so since we have learned to prepare it properly. This preparation should, whenever possible, be done under personal supervision instead of leaving it to outside parties.

Another factor which has added very much to the safety and comfort of the patient, is the employment of a special competent anesthetist, whose sole duty is to administer the anesthetic, and who thereby becomes remarkably skillful and expert in this line of work. Not only are renal complications rarely observed now, but also protracted nausea and vomiting have become very exceptional, and the convalescence of the patient has been rendered very much smoother and pleasanter in every respect. Only those who have been fortunate enough to have such a specialist in the administration of anesthesia can fully realize the importance of such an adjunct to the operating corps.

In summing up the causes to which we attribute our better results, both in regard to operative mortality as well as post-operative morbidity, are:

- 1st. A more simple and better aseptic technic, including the wearing of rubber gloves for all hands concerned in the operation.

- 2d. Better diagnosis and more careful preparation of the

patient, especially the acute inflammatory cases, whose abdominal section is delayed at least three weeks after subsidence of all acute symptoms.

3d. The employment of a trained, absolutely reliable first assistant.

4th. Centralization of all operative work, enabling the operator to give the greatest amount of personal attention to his patients.

5th. The careful closure and covering of all raw surfaces in the peritoneal cavity.

6th. The exclusive use of catgut prepared under personal supervision.

7th. A trained anesthetist, who administers a minimum amount of anesthetic consistent with good work.

524 PENN AVENUE.

DISCUSSION.

This paper was discussed by Drs. Herman E. Hayd, James N. West, Joseph Price, M. Stark, Oscar H. Elbrecht, H. O. Pantzer, and the discussion was closed by the essayist.

IN MEMORIAM—DR. L. H. DUNNING.

[DR. HUGO O. PANTZER, of Indianapolis, by appointment of the president, read an address on the life and character of Lehman Herbert Dunning, a former president of the Association, during which appropriate tribute was paid to this distinguished deceased Fellow.

The following officers were elected for the ensuing year:

President, Dr. Robert T. Morris, of New York City; *First Vice-President*, Dr. George W. Crile, of Cleveland, Ohio; *Second Vice-President*, Dr. Chas. L. Bonifield, of Cincinnati, Ohio; *Secretary*, Dr. Wm. Warren Potter, of Buffalo, N. Y., reelected; *Treasurer*, Dr. X. O. Werder, of Pittsburg, Pa., reelected.

The determination of the time and place of the next meeting was left to the Executive Council.

REVIEWS.

MANUAL OF OPERATIVE SURGERY. By JOHN FAIRBAIRN BINNIE, A.M., C.M. (Aberdeen), Professor of Surgery, Kansas State University, Kansas City, Fellow of the American Surgical Association, Member de la Société Internationale de Chirurgie. Second edition. Revised and Enlarged, pp. 655. With 567 illustrations. Philadelphia: P. Blakiston's Son & Co., 1905.

The second edition of this most excellent little work has been revised in many of its sections. Notable additions are in the chapters on the mastoid operation, on cerebral localization, on the duodenum and on tuberculous peritonitis. Its general scheme is to omit all description of procedures ordinarily thoroughly described in works on general surgery. Its great value lies in its clearness of description and in the very practical nature of its instruction.

It is beautifully printed on thin, fine paper, with gilt edges and soft, flexible cover.

AMERICAN PRACTICE OF SURGERY. A complete system of the Science and Art of Surgery by Representative Surgeons of the United States and Canada. Edited by JOSEPH D. BRYANT, M.D., and ALBERT H. BUCK, M.D., of New York City. Complete in eight royal octavo volumes. Profusely illustrated.

It is only within the last two or three years that the practice of surgery in this country has reached such a mature stage of development that it has become possible to secure in such a comprehensive work as this is planned to be the desired character of authority and also to anticipate that this character would possess a certain degree of permanence.

It was with these ideas in mind that the publishers undertook the execution of this work and commissioned Dr. Joseph D. Bryant and Dr. Albert H. Buck to act as its editors. These gentlemen are so widely and favorably known that nothing need be said as to their eminent fitness. A survey of the list of writers whom they have selected shows names among the list that could have been chosen for such responsible tasks. No foreign authors have been invited to take part in the work, which is distinctively American in character. The material is to be entirely original and will contain much that has never before been published. It is planned to cover the whole field of surgery in detail.

The first volume opens with an instructive and inspiring sketch of the evolution of American surgery, by STEPHEN SMITH, M.D., LL.D., of New York. In the history of this evolution he finds three distinct periods of development: the first, from the settlement of the country to the organization of medical schools, the

primitive era; the second, from the establishment of medical schools to the introduction of anesthesia and antiseptics, the *formative era*; and the third, which is now passing, the *practical era*. He aims to trace the origin and development of the scientific spirit which inspired and controlled the surgeons of the formative or pioneer period rather than to record the notable achievements of individuals, except in so far as such achievements illustrate the elemental conditions and forces which governed its progress and development, and his record is one to make the American surgeon proud of his birthright. The *practical era* is to be made clear by the writers to follow.

Aside from the introduction the volume is divided into five parts.

Part I, Surgical Pathology. Alfred Scott Warthin, of Ann Arbor, contributes a chapter on Inflammation, clear, practical, complete, and based on the broad biologic conception that the essential principles underlying the response of the animal organism to injury are the same for all forms of animal life. Edward H. Nichols, of Boston, describes the processes of repair. Albert George Nicholls, of Montreal, gives an admirable exposition of the nature and significance of the various disturbances of nutrition observed in connection with surgical diseases and conditions, and describes the various tumors, while Theodore A. McGraw, of Detroit, discusses the theories of their formation, and Gaylord, of Buffalo, well known for his researches in the parasitical relations of cancer, summarizes the argument in favor of the infectiousness of the cancerous process.

Part II, Complications and Sequelæ. The infections which sometimes occur in various surgical diseases and conditions are described by Paul M. Pilcher, of New York, and surgical shock, by J. C. Bloodgood, of Baltimore. Both of these important subjects are handled clearly and from the standpoint of the working surgeon.

Part III, General Surgical Diagnosis. Joseph D. Bryant, of New York, contributes an instructive chapter on the general principles of surgical diagnosis. Harlow Brooks, of New York, discusses the diagnostic value of a knowledge of the body fluids in general surgical disease. The radiographic study of the human body is well exemplified in the chapters on the epiphyses and their radiographic interpretation, by Preston M. Hickey, of Detroit, and the technic of radiographic work as applied to surgery and the interpretation of radiographs, by Walter J. Dodd and Robert R. Osgood, of Boston.

Part IV, General Surgical Treatment. This important division is ably handled by James E. Moore, of Minneapolis, and includes the preparation of the environment, of the materials used, of the surgeon and his assistants, of the patient, and the treatment of the wound. We would especially commend the paragraphs on drainage.

Part V, General Surgical Prognosis. This chapter is by Leonard W. Bacon, of New Haven, and with the volume index closes the volume.

As a whole, the authors have contributed matter of very unusual excellence. The individual subjects are handled concisely, practically and with a clearness of scientific insight that reflects the markedly broadening influence of collateral biological researches.

If future volumes can maintain the very high standard set by this first volume we do not hesitate to say with the editors of the work that we believe it "will command the respect and confidence of those who consult its pages," and will be one of the greatest surgical treatises of the world.

OPERATIVE GYNECOLOGY. By HOWARD A. KELLY, A.B., M.D., LL.D., F.R.C.S. (Hon. Edinb.). Professor of Gynecological Surgery in the Johns Hopkins University and Gynecologist to the Johns Hopkins Hospital, Baltimore; Fellow of the American Gynecological Society, Etc. With 11 plates and 703 original illustrations for the most part by MAX BRÖDEL, Associate Professor of Art Applied to Medicine in the Johns Hopkins University. Second Edition, revised and enlarged. In two volumes, pp. 1,336. New York and London. D. Appleton & Co., 1906.

As he looks into the present volumes, the reviewer feels again the thrill of pleasure that he felt eight years ago when the first edition of Dr. Kelly's work came into his hands.

The type is the same, the page size the same, but the margin has been cut down and the paper is not quite so heavy, so that the volumes are more easily handled. The revision has been thorough, much has been rewritten, and the printing is from new plates. The scope and plan of the work is similar to the first edition. Many changes have been made in detail, especially in the chapters on topographical anatomy, complete perineal tear and relaxed vaginal outlet, urethra, bladder, ureters and kidneys. New chapters have been added on local and palliative treatments; on displacements and pessaries, on menstruation and its anomalies, on bacteriology, on the use of the x-ray in diagnosis, on diseases of the hymen, on inversion of the uterus, on vaginal glands, on abdominal extirpation of the cancerous uterus (with fifty-six new illustrations), on the Alexander operation, and on gynecological diseases in children. The illustrations have been as carefully revised as the text, and include 113 new drawings by the incomparable Max Brödel.

What we said in appreciation of the first edition, eight years ago, is even more applicable to-day, that the work must be seen to be appreciated. It is remarkable for the clearness and simplicity of its style, the straightforwardness of its teaching, the richness of its clinical material, and the wonderful beauty and accuracy of its many illustrations. It is not an encyclopedia of

gynecology, but a mirror of the author's own methods; yet, to us who know of Dr. Kelly, his brilliant researches, mature judgment and skillful work at the Johns Hopkins, this limitation will not be a fault, but the best reason why the book should be ours.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Types of Puerperal Sepsis.—Wm. S. Stone (*Med. Rec.*, Aug. 11) divides the type of puerperal sepsis into toxemias and general infections. As toxemias are included: (1) those the result of absorption of putrefaction products of saprophytic bacteria, and (2) those the result of absorption of the products of pathogenic bacteria. Toxemias from putrefactive changes are the more common and are often efficiently treated by a dose of castor oil, which, by clearing out the bowels, allows the uterus to contract and assume its normal position. This type is closely simulated by a gonococcus endometritis, which, if treated by curettage, will surely be followed by salpingitis. The toxemias due to the products of pathogenic bacteria are characterized by the presence of an infected wound of the perineum, vagina, cervix or placental site, or by the presence of a cellulitis, which may or may not terminate in an abscess. Fever begins usually in the latter part of the first week and is high; pulse is rapid, full and strong, pelvic pain may be severe. The presence of an infected wound in the lower genitals, of an abnormal discharge, if situated at the placental site, or a hard tumor if a cellulitis is present, with entire absence of peritoneal irritation make the diagnosis and prognosis certain, as all cases of this type get well. The treatment consists of an ice-bag, cleansing the wound with salt solution, prompt incision and drainage of the abscess, combined with proper diet and hygiene. The general infections include three general varieties: (1) The type commonly called phlegmasia alba dolens, usually appearing first in the second or third week, is due to the spread of the infection through the hypogastric and external iliac veins into the femoral, causing a thrombophlebitis. (2) The type known as septicemia, pyemia or septicopyemia is characterized by the entire absence of physical signs in the pelvis. It is literally a blood poisoning from the beginning, and septic thrombi may be present in all parts of the body. In this type intrauterine treatment is not only a source of torment but is also harmful, the kind in which hysterectomy to be successful would have to be done before the symptoms appear. This type is best treated medically, it being less a surgical disease than typhoid. The writer suggests that baths might be used in this type as in typhoid. The gonococcus cases

occasionally follow this type, causing endocarditis and septic emboli. (3) The peritoneal type, almost invariably fatal, always begins early in the puerperium. There are two varieties, one best called peritoneal sepsis, in which the peritoneum is not reddened, and may even be paler than normal, a considerable quantity of thin seropurulent fluid is present, the pelvic organs show only congestion, all the classical symptoms of peritonitis rapidly appear and the patient succumbs. The other variety is less rapid in its course and may at first be confused with one of the toxemias, but signs of general peritonitis soon set in. The abdomen will be found filled with pus and a fibrinous exudate is present everywhere; the lymphatics are full of pus. These cases are the only kind in which hysterectomy, with the removal of as much of the broad ligament as possible, is indicated. Gonococcus infection may take this form.

Puerperal Fever.—A. Ernest Gallant (*N. Y. Med. Jour.*, Aug. 11) has devised a bivalve speculum, $\frac{3}{8}$ by 3 inches long, to allow continuous drainage from the uterine cavity and vaginal canal. This bivalve drain is long enough to enter well above the internal os, and after being introduced, the upper end of the blades can be separated by opening the blades of a pair of forceps within its canal, thus preventing the drain from slipping. This drain not only furnishes free drainage, but prevents after-pains, and by preventing retention of the uterine secretions renders the interior of the uterus unsuitable for bacterial growth. The writer reports a series of cases of puerperal fever treated by this drain with most satisfactory results. There is no claim that this instrument will bring about a cure in cases in which the infection has invaded the sinuses and veins.

Surgical Treatment of General Puerperal Peritonitis.—Cyrille Jeannin (*L'Obst.*, May) tells us that the treatment of general puerperal peritonitis has made great strides in advance since surgical methods have been employed. Daily the results are growing better. The author has collected from medical literature 118 cases that have been operated upon. These he classifies and adds to them three cases of his own. He finds that there have been sixty recoveries and sixty-one deaths after operation; that is, nearly one-half of the cases have recovered. There are varieties of puerperal peritonitis whose prognosis in case of operation varies. In the hyperacute cases death always ensues, while the more chronic cases are often cured by operation. The operative prognosis is better as the length of time after delivery before onset of the peritonitis increases. Post-partum peritonitis is more serious than post-abortive peritonitis, and the latter form is most favorable of all for operation. The immediate cause of the peritonitis may be a propagation of the uterine infection to the peritoneum without any trauma of the uterus or any involvement of the adnexa. This is the common form, and here the prognosis is good. Rarely it results from a per-

foration of the uterus, and here the prognosis is bad. When there are consecutive lesions of the adnexa intravention by operation is usually successful. Acute diffuse peritonitis is the usual form, beginning from the third to the sixth day, and the proportion of recoveries is 44 per cent. In phlegmonous peritonitis in which there is a tendency to the formation of false membranes, walling off the intestines from the pus deposits, the operative results are favorable. The most benign form is that in which there are several foci walled off from the general cavity. As to the microbic source of the infection the largest number of cases are caused by streptococcus, and these cases are as susceptible of cure surgically as those caused by other microbes. In cases of peritonitis left to themselves there is invariably a fatal issue. In those treated surgically there are frequent successes, hence the conclusion that every puerperal peritonitis should be operated on as soon as diagnosticated.

Modifications of the Structure of the Mammary Gland Due to Suspension of Lactation.—E. Meynier (*Riv. Crit. di Clin. Ped.*, June) has made extensive experimental studies of the effects on the mammary glands of cats, rabbits, etc., of sudden suspension of lactation at various periods after nursing has begun. He found that there was a gradual formation of new connective tissue in the interlobular and interstitial spaces of the gland, but that the glandular acini were never compressed by it. At first the infiltrating leucocytes were mononuclear, then polynuclear. Early in the process of change there was an accumulation of milk in the gland and a tendency to resume the function. Later the milk took on the characteristics of colostrum, and then atrophy began. The epithelial cells contained small fat globules at all stages of the change. Some practical considerations derived from these results are these: When lactation has been suspended for a short time only it is possible to recover the function, and the best method is the systematic emptying of the gland. If the gland for any reason is not entirely emptied by the infant there is a tendency to return to the state of colostrum, which will cause dyspepsia in the infant. When mixed feeding is resorted to it is best to alternate the feeding and the nursing so as not to allow the milk to turn to colostrum by too long stagnation.

Diagnostic Significance of Decidual Tissue.—W. P. Graves (*Bost. Med. and Surg. Jour.*, July 26) states that the passage of decidual membrane in a patient with symptoms of pregnancy and with a mass on one side, together with a history of flowing, is extremely significant of an extrauterine pregnancy, but cases do occur where this seemingly conclusive chain of evidence is not proof of an extrauterine gestation. An ordinary miscarriage may be preceded by the exfoliation of a part or the whole of the decidua vera. The pathologist who receives a specimen of decidual tissue should make his report with extreme

reservation, to avoid the commission of a serious surgical blunder. It may be impossible to differentiate even with great microscopical care, between an exfoliated dysmenorrhoeic membrane and the decidua of an extrauterine pregnancy.

Syncytioma Malignum.—John T. Hewetson (*Practitioner*, Aug.) reports a case of syncytioma malignum, the history of which brings out the following points: Metrorrhagia following abortion or labor, should call for prompt investigation, especially in women under thirty. Dilatation and curetting, in such circumstances is an operation of considerable responsibility, in view of the possibility of malignant disease. Sharp curettes are contraindicated in the parturient uterus and where septic infections exist. All such curettings should be submitted to an expert pathologist for microscopical examination. Continued metrorrhagia, after such treatment should be regarded as of serious import, and should call for fresh investigation and prompt radical measures.

Moles and Chorioepitheliomata.—Joachim Cortiguera (*Ann. de Gyn. d'Obst.*, June) states that up to 1905 literature furnishes us with 260 reported cases of chorioepithelioma. In many cases the tumor was preceded by a vesicular mole, an abortion or a normal labor. There are always found in the chorioepithelioma the tissue of the syncytium, and the cells of Langerhans, and less constantly connective tissue: these are the integral elements of the vesicular mole. At the same time there are many strong reasons why we should not connect the two growths in etiological relation. There are a large number of moles that are not followed by the appearance of a chorioepithelioma, even when they return several times; the cells of the syncytium are also found in men. The microscopic examination of portions of these growths do not enable us to tell whether or not they will take on a malignant activity. The symptoms which would lead to a suspicion of chorioepithelioma are the persistence of metrorrhagia, with the coming on of a cachectic condition and an enlargement of the uterus, with a soft, partially open os, after a mole, an abortion, or a delivery. There may be nodules of the tumor in the vagina, or the os may admit the finger and the growth be felt. But there are other cases in which the uterus shows no symptoms, but the tumor appears in another location, the lungs, liver or other internal organ. The valuable diagnostic points are discovered by intra-uterine palpation and microscopic examination. Not all of these tumors are fatal, some recoveries occurring after operation. According to some authors a preceding endometritis is a causative factor, but this precedes so many other uterine tumors that the author gives very little weight to this theory. The essential lesion must always be the superactivity of the syncytium acting as an irritant on the surrounding tissues. The author has observed eleven moles, and all of these patients have recovered

without the occurrence of malignant tumor. He has seen three cases of chorioepithelioma, which have all died as the result of the disease. Every woman who has a mole should be regarded as a possible candidate for chorioepithelioma. The incomplete expulsion of the mole or the placenta should lead to an intrauterine examination and a complete evacuation. If metrorrhagia persists, curettage and microscopic examination of the fragments are in order. If these have the character of the syncytium a hysterectomy should be done, removing the adnexa and all metastatic nodules. The prognosis is less bad than in case of the other epitheliomata provided that an early operation is possible. It is less grave after a mole than after labor or an abortion.

Acute Yellow Atrophy of the Liver in Pregnancy.—G. Acconci (*Ann. di Ost. e Gin.*, March, 1906), describes acute yellow atrophy of the liver as rare in pregnancy, its etiology obscure, and its fatality marked. He reports two cases observed by him, both of which were fatal. The symptoms began indefinitely rather early in pregnancy, and ended with stupor, during which the fetus was delivered. The woman remained comatose until death some days after labor. The etiology is obscure and the author believes that there is no specific cause, but that this is a clinical and anatomo-pathological syndrome that may result from various conditions and various agents. These agents may be the same that produce it in males, or it may be a manifestation of a severe autointoxication due to pregnancy. It may be the aggravation of a slight icterus, or may be a morbid entity. The same toxin may affect the fetus. The pregnancy is generally interrupted by the disease, and the fetus may be destroyed also. All forms of anatomical lesions of the liver are unfavorably affected by pregnancy.

Pulmonary Tuberculosis as an Obstetrical Complication.—There seems to be no doubt, according to Charles Sumner Bacon (*Four. A. M. A.*, Oct. 7) that in many cases pregnancy has a bad effect on the tubercular process. There may be a rapid development of the tuberculosis in the lungs or an acute miliary fever may appear. The bad effect is much more apt to appear when the disease is advanced or the nutrition is low from other causes. In the latter part of pregnancy we have disturbances arising from pressure due to the enlarged uterus. The effect of tuberculosis on pregnancy is slight, except in severe cases with considerable fever and cough when abortion is common.

The fetus may be infected, but this is rare, and probably such infections take place when there is a solution in continuity in the placental partitions between the maternal and fetal blood. In the mild forms of the disease labor may be quite normal. In emaciated patients both uterine and abdominal contractions may be feeble and inefficient. This, combined with the weakness of the patient, is an indication for early interference. Gen-

erally it is the puerperium which shows most markedly the effect of consumption. If a tubercular process undoubtedly exists in an unmarried woman there seems to be no excuse for a marriage which can only result in dangerous complications. When considering the care of a married woman with tuberculosis we should prohibit pregnancy except in exceptional cases. For these patients, artificial sterilization may be the legitimate operation. Before doing this we have to consider the possibility of recovery. When there is a possibility of a cure we must employ other means to prevent impregnation. When we have a pregnant woman we must decide whether or not the pregnancy should be interrupted. If the disease is not far advanced and the patient can have proper treatment and after care she should be encouraged to continue the pregnancy. On the other hand, if she cannot have proper hygienic surroundings and care she may be advised to have an abortion performed. A case complicated with heart or kidney disease, with hyperemesis or with other serious acute or chronic disease, furnishes additional indications for abortion. Abortion should be performed before the twentieth week. Later, an attempt should be made to carry the child to the period of viability. After the period of viability is reached and there is rapid or gradual failure of nutrition, due to stomach disturbances or to exhausting discharges, there will be important indications for premature delivery. Hemoptysis, exhausting uncontrollable cough or laryngeal or plural complications or other severe respiratory disturbances may call for an early operation. The method of operation should be that which furnishes quick relief from urgent symptoms and which assists and hastens labor. Under no consideration should the mother nurse her child, and it should not be kept in the same room.

DISEASES OF CHILDREN.

Spirochæta Pallida in the Syphilis of Unborn Infants.—H. Beitzke (*Berl. klin. Woch.*, June 11) gives the results of the examination of the tissues of eighteen cases of syphilis in unborn children observed by him. The germs are found in sections of the tissues of macerated fetuses, but not in smears from them. In only four of the eighteen cases examined did the author find *spirochæta pallida* in the tissues. The germs were most easily detected in the liver. This accords with the theory that the cause of syphilis enters by the blood from the navel and passes at once to the liver. *Spirochæta pallida* is seldom found in osteochondritis of syphilitic infants, but often in lungs, spleen and skin.

Spirochæta Pallida in Congenital Syphilis.—Paul Huebschmann (*Berl. klin. Woch.*, June 11) tells of the examination of a case of congenital syphilis in which *spirochæta pallida* was found. The most interesting lesion was that of the thyroid

gland, which is exceedingly rare. The spirochetes were not found in the spleen and lungs, but were present in kidneys, liver, placenta and cord. There were interstitial pancreatitis, enlarged spleen and lesions of the bones. The number of spirochetes in the thyroid and pancreas was very large. The germs were found in the connective tissue and the blood vessel walls, especially the capillaries. They were between the cells of the connective tissue, never in the epithelial cells.

Hereditary Syphilis and Syphilitic Heredity.—Paul-Louis Gaston (*Ann. de Med. et Chir. Inf.*, June 15) draws a distinction between hereditary syphilis and syphilitic heredity. Both conditions are often fatal to the descendants, but they act in different ways. Hereditary syphilis produces syphilitic lesions that often kill the infant, or prevent its birth alive. Syphilitic heredity is like any bad heredity and results in degeneracy or dystrophies such as occur from tuberculosis or other diseases in the parents. The roles of the father and mother are about the same as to the production of the malady in the infant and its mortality. The mother has the marked influence in producing dystrophies and degenerations in the child. Mercurial treatment sterilizes syphilis and prevents its transmission to the descendants. Every man or woman having syphilis should be treated for the sake of the children, and should undergo a fresh treatment before marriage and connection, as thus there is hope of obtaining healthy offspring. This is true whether the syphilis is new or of old standing in the patient. Hereditary syphilis shows direct transmission, while syphilitic heredity results in a failure of the normal evolution of the product of conception. The results of hereditary syphilis are always syphilitic lesions, in which spirochaeta pallida is found. Syphilitic heredity produces organic or functional troubles of nutrition or development, without any specific character, such as any morbid heredity will determine. Morbid heredity depends on the parents before, at the moment of, and after conception. It is variable in its effects, according as mother or father is diseased. It depends directly on the physical condition of the mother at the time of conception. Hence both parents must be studied, before, at the time of and after conception to arrive at certain conclusions. Whatever the parents have at the time of conception they transmit to the child; after conception the father cannot transmit anything to the child except through the mother, and there is no direct transmission but a modification of the nutrition of the embryo in the womb. Such is no longer contagion, but congenital morbid heredity. We have heredo-transmission, heredo-contagion and heredo-gestation. We must study first what was the origin of the syphilis, from mother, or father, or conjugal. Mortality of the child is one of the most important indications of parental syphilis; half the pregnancies result in abortion, premature labor or death soon after birth. Syphilis,

paternal, maternal or conjugal, is equally fatal to the child, but in different ways at different periods of the disease. Paternal syphilis at whatever stage, and of whatever virulence, gives mortality in the first generation, but it diminishes with the age of infection and lessened virulence, and is rare when the syphilis is of the nervous system. It affects about one-fourth of the children, and with equal frequency early or late in life. Dystrophies are more frequent in proportion as the disease grows older. Maternal syphilis with a healthy father is grave for the child; all children are affected in some way. When it is ante-conceptional no healthy child is born if treatment is neglected. The child does not live and we know little of its effects. Syphilis of the father produces abortions; that of the mother produces dead-born children and those that die soon after birth. Conjugal syphilis is less destructive than maternal, more so than paternal. Syphilis of the second generation is more difficult to study. There is not a perfect immunity transmitted by the parents. Its mortality is equal whether it be maternal, paternal or conjugal. Syphilitic heredity has no special characteristic that will separate it from other forms of degeneracy. Hereditary syphilis may be prevented by preventing marriage unless the parents have been thoroughly treated and just before the marriage. Such treatment is the safeguard of the family. A syphilitic of three or four years standing who has been regularly treated may hope to have a normal family, after submitting to medical examination to find out his exact condition.

Observations on Epidemic Cerebrospinal Meningitis.—G. Daddi (*Riv. Critica di Clin. Med.*, June 30 and July 7) gives the results of bacteriological examinations of the cerebrospinal secretion from six cases of epidemic meningitis treated in the Florence hospital. The epidemic was not virulent, for half of the cases recovered. It was confined to three dirty houses in the midst of other clean ones. Out of the six cases five showed the diplococcus intracellularis meningitidis of Weichselbaum, and one (the pneumococcus) of Fränkel. The vitality of the germs obtained was slight; they did not live more than two or three days at the most; they developed slowly and sparingly at 28°–30° C. and best at 36°–37° C. In the presence of moisture they lived longer. We may state definitely that these germs are killed by drying and do not develop at the normal temperature of the body. The germs were not found in the nasal mucous membranes of five cases in which the secretion was examined. Inoculation of animals did not show the germs to be virulent. The agglutination of the blood serum of these patients was almost specific, occurring with the serum of other patients suffering from the same disease, but not of those with other diseases. It did not occur in dilute solutions or at all periods of the disease.

Acute Poisoning by Quinine in Infants.—Osvalde Federici

(*Riv. di Clin. Ped.*, May, 1906) describes a case of acute quinine poisoning observed by him, together with some experiments on animals made by him with a view to ascertaining the effect of quinine in the stomach. He believes that acute quinine poisoning in infants is more frequent than is supposed in countries where quinine is habitually used for malarial symptoms. The infant treated by him was sixteen months of age, and swallowed twenty to twenty-five quinine confections, estimated at 4.5 grains of quinine. The effect of the drug was very rapid and resulted in vomiting, collapse and convulsions, ending in coma and death in about two and a half hours after the ingestion of the drug. Postmortem there was congestion and ulceration of the stomach and intestine, but experiments on animals showed that the ulceration was postmortem. The solubility of the salt of quinine used hastens the action of the drug. The prime effect seems to be directly on the nervous system. There is considerable difference of opinion as to what is the poisonous dose of quinine in infants, and there is need of accurate study of this point.

Generalized Emphysema in Children.—Chartier and Denechau (*Arch. de Med. des Enf.*, June) tells us that the introduction of air into the tissues by accident or criminal means is rare. So are cases resulting from traumatic or pathologic ulceration of the mouth, or of the nasal fossæ and their sinuses, and from direct penetration of intestinal gas into the abdominal walls. Generally subcutaneous emphysema is located at the base of the neck or upper part of the thorax, and is produced by a solution of continuity in the broncho-tracheal apparatus. Traumatic emphysema results from fractures of the bones of the thorax. There are cases resulting from ulceration of the larynx, trachea or bronchi. Others result from the rupture of a tuberculous cavity into the mediastinum or neck. Generalized emphysema may be perilobar, mediastinal, or subcutaneous, and is quite frequent in children, due to the porosity of the pulmonary parenchyma and the feeble resistance of the alveoli to pressure. Intense dyspnea, convulsive cough, and spasm of the glottis are the immediate cause of the passage of air into the tissues. Convulsions, laryngeal spasm, hydrophobia, pertussis, spasmodic cough in pneumonia, and asphyxia from various causes bring the condition about by rapid and repeated elevation of the intrapulmonary pressure. There are other cases in which the mechanical element takes little part, while the degeneration of the lung tissue is the main factor. Such occur in pneumonia, measles, and tuberculosis.

Surgical Treatment of Disease of the Faucial Tonsils.—As indications for surgical interference in disease of the faucial tonsils W. E. Casselberry (*Clin. Med. Rec.*, June) mentions certain types of "rheumatism" or secondary arthritis, endocarditis, nephritis and phlebitis following tonsillitis, frequently recurrent

tonsillitis, cervical adenitis in any degree approaching persistency, and systemic toxemia which may result from the putrefaction of accumulated debris in the crypts of the tonsils. In order to determine the methods of choice in treatment as regards avoidance of danger, minimizing of pain and effectiveness and permanence of result, the writer has scrutinized the records of 480 cases. Of children under 14 years of age, operated upon with general anesthesia, there were 165, of whom nine-tenths took ether alone or preceded by A. C. E. mixture, without accident. In these cases the writer nicks the tense edge of the anterior pillar; adjusts a plain ring tonsillotome, not too sharp; draws the tonsil into it with a grasping forceps, and shells it out rather than cuts it. The process is repeated until all fragments are removed. The other tenth of these cases took gas or bromide of ethyl, which is suitable for easy cases of the pedunculated type not requiring prolonged dissection. Of children under 14, but mostly over 10 years of age, 112 were operated upon with local cocaine anesthesia, applying a fresh 5 per cent. solution supplemented by adrenalin by repeated spraying over the tonsils and into the crypts. A very sharp tonsillotome is used in these cases, but all fragments must be carefully removed. In none of these 277 children was there an unusual hemorrhage, whereas in 203 operations upon adults this occurred in fourteen cases. Complete removal of diseased tonsils is necessary, as acute tonsillitis is apt to recur in even a trace of remaining tonsillar tissue. In about two-fifths of the above cases of which later information was secured the ratio of recurrences of troublesome tonsillar disease was 1.6, and in the cocaine series 1.4. Most of the recurrences took place during the period when incomplete tonsillotomy was in vogue.

The Tonsil as a Portal of Microbic Invasion.—A. Jacobi (*Arch. of Ped.*, July) says that a number of facts should be considered in connection with the structure and the absorbing and transmitting power of the tonsil. Its surface epithelium is not uniform, and may admit foreign material even without a lesion. Thus an invasion of the normal tonsil is possible. A catarrh, with destruction of epithelium, may add to the possibility. The lymph current near the tonsil is less active than that of the pharynx at some distance. There are, moreover, no lymphatic sinuses round the tonsil. There is a system of closed canals in the follicles which do not open into the connective reticulum. The external deep surface of the tonsil is covered by a firm fibrous capsule. Still, according to many, there is a lymph communication between the tonsil and at least one lymph node situated near and below the crossing of the sterno-cleidomastoid and digastric muscles. Exposure, and many diseases, change the surface and the structure of the tonsils. Every new inflammation changes them. New cell infiltration and cicatricial tissue render absorption less possible. Blood and lymph vessels are

compressed and undergo atrophy. Thus in advanced life the tonsil gets harder and smaller, and infections become less. No tonsil remains long in its original condition; and the same deleterious influences will no longer prove effective. Laboratory injections into the normal tonsillar structure are made under pressure and prove nothing, or very little, for the unembarrassed organ when *in situ*, and surely not under pathological conditions. Thus, while the normal infantile tonsil which has not suffered from previous exposure or disease may or must be believed to permit some invasion into the tonsillar structure and sometimes even beyond it, microbic invasion through the tonsil is not predominant over that which takes place through the lymph apparatus of the pharynx. That agrees perfectly with the clinical observation of local toxic affections of the oral cavity, according to which membranous affections limited to the tonsil cause no, or little, adenitis or constitutional symptoms.

Joint Diseases of Children.—In view of the all-too-general tendency to call all painful joint affections rheumatism and to treat them by internal medication for that disease until permanent changes have occurred, such papers as that of De Forest Willard (*N. Y. Med. Jour.*, June 23) cannot be read too frequently; nor can it be amiss to present his conclusions, simple and almost self-evident as they appear. He calls attention to the fact that pain, although usually dwelt upon as one of the cardinal symptoms of tuberculous joint disease, may be entirely absent, while local pain is the eruption. Limp and muscular rigidity precede the complaint of pain. The writer concludes that early diagnosis is the most important of all considerations. Physicians are responsible for a large majority of joint destructions, chiefly from carelessness or indifference in the examination of their patients. A child with any peculiarity of gait or carriage should be examined naked. Every physician should abandon the thought that pain in a single joint in a child means rheumatism. A limp or peculiar gait with rigidity of periarticular muscles in a child always means some form of invasion, probably tuberculous, possibly septic. Abort tuberculous infection by immediate absolute rest and fixation of the joint. Put the patient out of doors, day and night, for a long period of time. Wise conservatism consists in the prompt application of all methods of relief, whether hygienic, mechanical, or surgical. In children conservatism should be the rule, since youth has remarkable recuperative power. A limb that can readily be saved in a child, in the adult will demand amputation. If an operation will best accomplish a cure, such operation is true conservatism. In septic cases following streptococcic, staphylococcic, pneumococcic, or gonococcic infection, open early and freely.

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ORIGINAL COMMUNICATIONS.

ACUTE PANCREATITIS—WITH A REPORT OF FIVE CASES.*

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IN a recent article, "Digestive Disorders and Abdominal Pain," etc., *Medical Record*, January 20, 1906, I called attention to the difficulty in making a definite diagnosis in cases of abdominal pain located chiefly, at the time of onset, in the epigastrium, by first describing the region as follows:

"The field assigned to me for consideration is comprised in an area irregularly pyramidal in shape, the base not exceeding three inches square in the normal human subject, with the apex made by the common biliary duct, head of the pancreas, the duodenal end of the stomach, and the first portion of the duodenum; while in the base, during health, we have the fundus of the gall-bladder, a portion of the lesser curvature of the stomach, etc."

Following this description of the space in which we find the head of the pancreas, etc., to quote again, I made the fol-

*Presented at the 19th Annual Meeting of the American Association of Obstetricians and Gynecologists, held at Cincinnati, September 20 to 22, 1906.

lowing statement: "The difficulty of clinically establishing an absolute diagnosis of disease invading one of the structures mentioned as forming the apex of the pyramid, can readily be understood, and therefore it is manifestly important that all aids in the chemistry of digestion and the excreta be called into play. Unfortunately, from a clinical standpoint, chemistry has not reached that degree of perfection one could wish for, when a definite or absolute diagnosis is demanded."

Chemical analyses, as now understood in pancreatitis, are frequently misleading, and as a result of these conflicting chemical conditions symptomatology must for the present be relied upon by us in urging our patients to submit to an abdominal section which smatters somewhat of an exploration. Yet far better be it that such an exploratory examination be made, with its findings, than to wait for some complex urinary, blood and digestive analyses, which take from a few minutes to the best part of a day of ultra valuable time in the disease under consideration. This fact is more than evident in those cases of acute pancreatitis accompanied by rapid toxemia, and followed by death in from twenty-four to seventy-two hours.

The chemistry of pancreatic disease is yet in its infancy, and relates chiefly to the feces and urine. The excreta contain in many instances globules of fat and partially digested muscular fiber.

At the meeting of the Association of American Physicians held in Washington, D. C., in May of this year, Dr. J. Dutton Steele, of Philadelphia, discussed the value of Adolph Schmidt's nucleus test for the diagnosis of pancreatic diseases. According to experiments on dogs, when complete degeneration of the pancreas existed, the nuclei in the muscle of meat that has been eaten are not digested. The finding of them in the meat fibers of the stools suggested the diagnosis of absence of the pancreatic juice. Dr. Steele has confirmed this finding of Schmidt's, but has also discovered that certain disturbances of the digestive tract might cause the same phenomena.

Should an analyses of feces be demanded in an acutely toxic case, one can see the loss of precious time waiting for the stools, when an exploration would promptly discover the condition, and save life and time.

Liquid fat has been expelled after normal stools, and the stools are said to be much larger than normal when compared

to the amount of food intake. These two excreta evidences can only be considered in chronic pancreatitis. The urine has frequently been cited as containing sugar. I shall report five cases in this paper, none having sugar at any time, either before or following the operation. Dr. Thayer, *Johns Hopkins Bulletin*, November, 1905, reports five cases, none of which contained sugar. With these ten cases, I am inclined to give no weight to the presence of sugar as a factor in acute pancreatitis.

Lipase was shown by Hewlett (see Thayer's article) to be a constant factor in all cases of insult to the pancreas, but to obtain this reaction requires a complex chemical outfit and process, and a period of more than twenty hours' actual preparation. During such a period of time one would lose a brilliant opportunity of demonstrating surgical efficiency as a life saver.

Dr. P. J. Cammidge, *B. M. J.*, May 19, 1906, in speaking of the urinary examinations, describes an improved method of performing his so-called pancreatic reactions. He has simplified a former very complicated technique, but does not contend that the result is positive of pancreatic inflammation, but thinks it of considerable assistance, always advising, though, to control the urine examination by an investigation of the feces.

The difficulty in this test is again that of a precious time consumer, as even this simplified test requires first a specimen of the twenty-four hours' urine, and then an analysis time of a few hours to over night.

Causation.—That the duct of Wirsung is a mode of entry of infection, etc., has been demonstrated on several occasions. One of the hemorrhagic cases reported in this paper presented two small biliary calculi in the duct of Wirsung. Traumatism, alcoholism, and arteriofibrosis are also factors.

Opie has demonstrated a distinct relationship between gall-bladder disease and pancreatitis. Stones in the common duct may plug up the Vaterian papillæ, and a retrograde flow of infected bile may enter the open duct of Wirsung.

Guleke ("Experimental Pancreas Affections," *Archiv. f. klinische Chir. Langenbecks*, Berlin), has been studying on a large number of dogs, the affections of the pancreas induced by injection of bile, blood, and oil in the outlet of the pancreas; also by ligation of its bloodvessels. He states that the disturbances resemble very closely those of acute pancreatitis in man.

Cause of death in the acute cases has been summarized by

Doberauer (*Beit. Z. klinische Chir.*, Von Bruns Tübingen, Vol. XLVIII, No. 2) in an analysis of six acute cases, and thirty-five experiments on dogs, as due to a toxin; and Guleke demonstrates, in his experiments quoted above, that in acute necrosis cases death is due to intoxication with trypsin.

In the five cases reported in this paper, three were hemorrhagic, in one of these the pancreas being almost completely destroyed without slough formation, and two resulting in abscess formation. None of these was accompanied by the discharge of any slough, although sloughing is one of the terminations of an acute inflammation of this viscus.

Symptoms.—The onset of this condition is usually a sharp pain, accompanied with varying degrees of shock, rapidly followed in some cases by a profound toxemia, denoted or characterized by a peculiar cyanosis and lividity, with shallow breathing and rapid pulse.

The pain is frequently of a far more intense degree than that of appendicitis or gastric perforation, etc.; in fact, my suspicions were aroused in two of my cases by the large quantities of morphine used by the family physician to control pain.

Hiccough is a symptom of relative frequency and persistence; there is vomiting with and following the pain onset. Pain in the back, of an intense splitting character, has been evident in three of my cases. These symptoms, when considered with a history of previous digestive disturbances and gall-bladder or duct invasions, should cause us to give the subject of pancreatitis great weight.

The subsequent manifestations are those of any ordinary peritonitis: *i. e.*, abdominal distention, obstruction due either to pancreatic pressure or intestinal paresis. Later, a tumor formation anywhere in the epigastric, or rather supra umbilical zone.

Treatment.—If in doubt, explore. If upon exploration we meet with a peculiar bloody, beef-broth like serum, or peculiar warty, yellowish-white plaques (fat necrosis) upon the omentum or mesentery (provided no strangulations exist as a cause of this bloody serum), we can safely extend our search to the pancreas.

If an acutely hemorrhagic, enlarged pancreas be found, an incision should be made in its coat of peritoneum, and a puncture or punctures made in the pancreas itself. Gauze, or

other drains, should be placed in and about these incised and punctured areas.

If gangrenous or suppurative, drainage sufficiently free to allow of ready expulsion of the sloughing material and drainage of the pus should be provided, either by the anterior route, or in the costa-vertebral angle.

The question of doing a cholecystotomy or not is one that each individual case itself will present for consideration.

In the five cases reported in this paper, the gall-bladder was drained twice, each time for large numbers of stones. In one of the remaining cases it was palpated and inspected without being drained. In the remaining two cases it was not seen owing to the pus collection being well to the left.

The cholecystotomy cases died, while two of the remaining cases recovered, and the third died weeks later from exhaustion and multiple infective abscesses.

CASE I.—*Acute Hemorrhagic Pancreatitis*.—Referred to me by Dr. N. Dann in 1901. A female, about fifty-three; rather corpulent; suffering from intense epigastric pain, most pronounced in the gall-bladder region. There was rigidity of the upper zone, but more marked over the right rectus. She had a temperature, varying from $99\frac{1}{2}^{\circ}$ to 102° , and a pulse of 90 to 100. I saw her on the third day of the attack, at which time she was complaining of an acute pain in the gall-bladder region, and presented an anxious countenance, dyspnea, cyanosis, and general lividity, the abdomen being somewhat distended. A diagnosis of cholelithiasis and cholecystitis was made. An incision to explore the gall-bladder was made. Upon incising the peritoneum, a large quantity of bloody serum was exuded, and upon exposure of the omentum and mesentery, multiple white plaques were observed. A diagnosis of pancreatitis with fat necrosis was made, the latter verified by microscopical analysis. The gall-bladder, very much distended, appeared in the incision. Upon palpating it was found filled with small stones, giving one the impression of a small bag of shot.

A cholecystotomy was done, over two thousand three hundred and fifty stones, varying in size from a millet seed to that of a large pea, were removed. The bloody serum was removed and a peritoneal drain employed. No further investigation was made, as the patient's condition would admit of no further manipulation. Death followed in twenty-four hours.

CASE II.—*Acute Hemorrhagic Pancreatitis*.—Miss D., age thirty-two, was taken with a most excruciating pain in the abdomen while at mass, at eleven o'clock on Sunday morning, October 8, 1905. The pain was so severe that she fell, although she retained consciousness. Upon arrival home about noon, she was seen by Dr. Hadden, to whom I am indebted for the case, who gave her a quarter grain of morphia, followed it in two hours with another quarter grain, and again in two hours with another equal dose. I saw her at 7.30 P.M., and found a rigid abdomen and pain only in the left iliac region. Her pulse was 98, and the temperature 100. There was a peculiar lividity and a most anxious mentality. Immediate operation was advised. She was operated upon about eleven hours after the onset of pain, through a Kammerer incision. The abdomen contained a large quantity of beef brothlike bloody serum. The appendix was not acutely involved, but the inflammation was a chronic one, characterized by a central distention and by a distal and proximal atrophy. The appendix was removed and the incision was continued upward, after I had satisfied myself that the pelvic contents were normal. Upon pulling down upon the stomach and duodenum, the pancreas was readily seen under its peritoneal layer as large as a fair sized fist and of a blue-black color. There was marked edematous infiltration along the ascending colon and right retroperitoneal space.

The peritoneum was punctured in several places to allow of drainage of this region. The peritoneum over the pancreas was incised, a blunt instrument passed into the pancreas, and a large cigarette drain and additional gauze packing introduced; and after a large piece of rubber tissue had been used as a dam to exclude as much of the contents as possible from the general cavity, the abdomen was sutured up to the drain. There was a profuse discharge with a musty odor, and of the same color as the fluid found at the time of the operation, but with an additional mucilaginous feel, which continued for six or eight days, it being necessary to change large abdominal dressing pads four to eight times a day. During the first five or seven days it was observed that areas of fat necrosis would appear on the subcutaneous fat in the drainage gap. Pain of a splitting character in the back was a feature from the first day until the third week. No sloughs were discharged, the drain sinus persisting until the latter part of November. No sugar was ever found

in the urine, and no digestive disturbances were noted during the entire convalescence. The gall-bladder appeared healthy, so no cholecystotomy was done.

CASE III.—*Hemorrhagic Pancreatitis: Complete Destruction of the Pancreas: Two Gallstones in the Duct of Wirsung.*—This patient was referred to me by Dr. Mayne of Bensonhurst. Male, about forty-four; previous health good, barring some slight digestive disturbances. Was taken ill eleven days before I saw him, with epigastric pain, so severe as to require about four grains of morphia in thirty hours. Shock well marked; pain in the back; also singultus and vomiting. It was said that he had eaten rather heartily of green corn the day before his attack.

He was under Dr. Mayne's care for a supposed attack of cholelithiasis and cholecystitis, this diagnosis being more and more positive as the days passed, as he gave evidence of tumefaction in the region of the gall-bladder.

When seen by me on September 20, 1905, there was a temperature of 100 8-10° by mouth, pulse 92. He presented the countenance of an extremely ill patient; very restless; intense backache. That he was a hemophiliac was stated by himself, and that it was a family tendency, three of his family having had bleeding histories, one sister dying from hemorrhage.

It might be stated now that his hemorrhagic history caused Dr. Mayne to keep from operating until a last resort.

Upon examining his abdomen, a large pyriform mass was found that seemed, without question, to be an enlarged gall-bladder. As he had been so great a sufferer, although knowing full well his chances with the hemophiliac history, he requested operation for relief.

We opened his abdomen in the right rectus, coming down upon a small gall-bladder, full of mulberry calculi, that lay well concealed behind the liver, and in the usual site of the pylorus was a mass of exudate, with three or four white bodies simulating small portions of corn. With the corn eating history, the sharp pain and stomachic symptoms, our diagnosis was changed to a gastroduodenal perforation, with occlusion by exudate, and having had considerable hemorrhage in the incision, and bearing his hemophiliac history in mind, it was deemed advisable to do a cholecystotomy and pack about the exudate, trusting to nature to produce a cure.

The patient had some relief, but his symptoms of nausea and vomiting continued. This we attributed to the pressure in and around the duodenum. Sixteen hours after the operation bleeding occurred in the incision; packed with adrenalin gauze. Two days later, same occurrence. Three or four days later, bleeding again; slight, easily controlled. Hiccough and vomiting, pain in the back and extreme restlessness continued, small sloughing shreds and free discharge from the drains taking place. Mass subsiding, about the tenth day we were able to pass gauze drains well down into the site of the former mass.

Patient requested to be taken home on the thirteenth or fourteenth day; this was done. About six days after being taken home, he was seized with a very profuse hemorrhage from the wound; packed and checked only to recur in a few hours, death following that night.

Autopsy showed almost complete hemorrhagic destruction of the pancreas, only a very small portion being left; two small stones in the duct of Wirsung; stomach and duodenum negative; gall-bladder and ducts empty; large retroperitoneal clot; no slough.

Commenting upon this case, with the above history, is hardly necessary, as upon autopsy it took some time to liberate the gastroduodenal portion of the digestive tract from the remains of the original exudate. In fact, for some time it was thought that both perforation and pancreatitis existed. More careful search by Dr. H. Brooks showed but the latter lesion, and even with the change in diagnosis and autopsy findings the proper treatment was carried out.

CASE IV.—*Suppurative Pancreatitis*.—Mr. S., aged 49; Austrian by birth; hard worker; no vicious habits. He has suffered from irregular attacks of sharp shooting pain for the past twenty-two years. These pains would begin in the epigastrium, located chiefly over the gall-bladder site, would travel upward and backward between the shoulder blades; vomited with all these attacks, but never jaundiced.

At 2 A.M. on November 5, 1905, he was seized with an attack, located as all former ones, and more painful than usual in the right area. Three-quarters of a grain of morphia was administered, the pain still persisting for twelve hours. This right-sided pain was followed next day by a dull pain in the left side, in the region of the spleen. At this time a hypodermic was given

over the region of the left-sided pain. For three days following the onset pain the abdomen was distended, and following the subsidence of the distention, a mass was felt in the region of the spleen. This mass was at first thought to be an infection from the hypodermic administered in this region.

The patient was observed for ten days before I saw him, during which time his temperature varied from 99° to 104° , with a pulse rapid in proportion. I saw him on the night of the fourteenth of November, at which time he had a temperature of 102° , and a pulse of 108. His abdomen was somewhat distended, the right rectus more rigid than the left. To the left side, about the tenth costal cartilage, a mass about the size of a fist could be distinctly palpated. This mass did not make any excursions upon breathing, as would be expected of a large spleen.

A tentative diagnosis of an abscess associated with the lower pole of the spleen was made. Stating that it was possible that a gastric perforation had taken place, with perigastric abscess walled in, and that while it might be pancreatic in its origin, little weight was given this theory, owing to the extreme left-sided position of the tumor.

A blood count was requested, and made by Dr. Brooks. I herewith incorporate his letter, as it is also of interest from a clinical standpoint as to diagnosis:

MY DEAR DR. ERDMANN: Examination of the blood of Mr. S. shows the following characteristics:

Hemoglobin.	79%
Red corpuscles.	4,720,000 per c.mm.
Leucocytes.	19,320 " "
Blood plates.	Few
Clot formation.	Rapid.

Alkalinity 176 mg. per 100 c.c. calculated as NaOH. (Normal is 266 mg. per 100 c.c.)

The red corpuscles are fairly constant in size, poikilocytes are found in small numbers only, and though the hemoglobin staining is quite irregular and somewhat deficient, no nucleated or degenerated red corpuscles are present.

No malarial plasmodia or pigmented leucocytes are present.

DIFFERENTIAL LEUCOCYTE COUNT.

Polynuclear neutrophiles.	85.75%
Small lymphocytes.	8.00 "
Large lymphocytes.	1.50 "
Mononuclears.	1.00 "
Eosinophiles.	2.25 "
Basophiles.	0.25 "
Transitionals.	1.25 "

The blood therefore shows a moderate high polynuclear leucocytosis, which when taken in conjunction with the clinical manifestations, seems to be highly suggestive of purulent inflammation.

There is no response to the Widal reaction, even in as strong dilutions as 1:10.

There is but very slight response to the idiophylic reaction, but this I have found to be very inconstant except in large and long-standing pus collections.

It seems to me that the tumor involves the spleen, and also extends to the right toward the fundus of the stomach. I was unable to find anything about the gall-bladder.

Briefly stated, the case shows a moderate degree of secondary (symptomatic?) anemia with a moderately high polynuclear leucocytosis which taken with the other clinical signs, seems to me strongly suggestive of pus, probable located in the region of the spleen. There does not seem to me anything satisfactorily explaining the splenic tumor in the past history of the case, and I should therefore infer that it is of recent origin.

Very sincerely,

HARLOW BROOKS.

Dr. Bruder, the attending physician, requested the patient's son (a physician) to allow me to operate, but a further consultation was had by two very able clinicians in the medical fraternity, both of whom, in the face of the temperature and blood diagnosis, advised no operation.

On November 16, his temperature was 103, pulse 128. The attending physician, Dr. Bruder, again insisted upon operation. The family were now anxious that operative procedure be undertaken, and sent him to me for the work. I operated upon him at 4 P.M. in the presence of several physicians, one of them

being one of the consultants who advised against such procedure. An incision was made through the outer edge of the left rectus, and upon entering the peritoneal cavity a large mass of exudate, omentum, etc., resembling somewhat that seen in Case III, was observed, but with only one or two indefinite spots of fat necrosis. This mass was carefully punctured with the finger and a pair of forceps, evacuating about one quart of foul-smelling, greenish-yellow mucuslike pus, with here and there flakes of fat necrosis and small bits of tissue. The cavity led down to the tail of the pancreas, and a large cigarette drain was introduced. Free drainage of a musty odor continued for ten days, during which time fat necrosis was observed in the cellular layer of the skin.

The patient was discharged in his son's care on November 29, with but a small sinus. This healed in about two more weeks. The gall-bladder was not exposed during this operation, deeming it advisable not to assume any undue risk by infection.

CASE V.—Mrs. F., 63; mother of a physician; rather corpulent. Was explored by Dr. W. T. Bull three years before for what was supposed to be an appendicitis. Upon opening the abdomen, the appendix was found normal. The incision was then extended upward and the gall-bladder explored. This was also found normal. The incision was sewed up, the patient making a perfect recovery.

There have been some digestive disturbances for the past three years. About three weeks before I was called, she was seized with a pain similar in character to that for which she had been explored three years before, requiring fairly large doses of morphia to allay the pain.

Although having a temperature that was indicative of pus, and having a tumor present on about the twelfth day that was to the left of the median line in the epigastrium, no surgical weight was given her case. This tumor became superficial enough to cause a distinct visible elevation on the skin over the left rectus, about the sixteenth day. The patient was constantly becoming weaker and more feeble.

On the twenty-first day I was called, and demonstrated pus by aspiration and made the statement that I thought with the previous history she was suffering from a pancreatic abscess. She was operated upon by me on January 9, 1906. Upon incising the skin, about two ounces of pus were evacuated. Deeper

dissection was made in a tortuous downward and inward direction, following the sinus that had perforated through the rectal sheath. A large collection was finally evacuated that seemed to be practically in the median line.

The patient had some relief from her pain, but complained of constant backache and nausea; was very restless and would vomit almost daily. Drainage was free and foul. The temperature wave was from $99\frac{1}{2}$ to $102\frac{1}{2}$. In her second week it was necessary to incise an abscess to the right of the right rectus, that seemed to be associated with the lesser peritoneal cavity. A week or ten days later another appeared to the left of the median line, just above the umbilicus. At the end of another week or ten days it was necessary to incise another. She rapidly became more prostrated, and finally died February 24, about eleven weeks from the onset of her disease.

None of these five cases had at any time any evidence of sugar in the urine, frequent analyses being made in four of the cases.

In conclusion, I would call attention to some of the pronounced symptoms:

The marked pain at the onset.

The sharp intoxication of some of these cases.

The dyspnea and lividity seen in many.

The constant splitting backache; and call attention again to the indefiniteness and difficulties in the present state of the chemistry of the urine and feces; and finally to emphasize early exploration when a given set of symptoms, such as are presented in this paper, manifest themselves.

60 WEST FIFTY-SECOND STREET.

PERITONEAL ADHESIONS.*

BY

ROBERT T. MORRIS, M.D.,

New York.

WITH peritoneal adhesions we blow hot and we blow cold to-day. We make peritoneal adhesions to prevent the occurrence of volvulus, to hold the abdominal and pelvic viscera in place, and for protection of defects. On the other hand, we have peritoneal adhesions which call for attention on the part of the surgeon, and those are the cases of which I wish to speak this

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afternoon. We have cases of peritoneal adhesion equally extensive with those calling for the surgeon's work, but cases in which the patient is not aware that he or she, as the case may be, has any peritoneal adhesions. It is the elaboration of these cases that calls for such observation as the members of this association are capable of making, and the proper classification of the cases for work, or for no work. When we have peritoneal exudation as a result of irritation, no matter what the cause of the irritation—toxins, fish-bone, bullet, stiletto, ruptured appendix—the exudation has two or three functions to perform; to close the stomata in the endothelium, in order to keep the toxins from entering the lymph channels too rapidly. The exudation dilutes toxins and parries the blow. It limits peristalsis, so that the toxin, or whatever the irritating element may be, will not become diffuse. This is speaking generally. After the function of the lymph exudate for protective purposes has passed, it becomes gradually absorbed, disappears. The tendency is for the exudate to disappear out of this great lymph chamber, the peritoneal cavity. But there are many permanent forms of peritoneal adhesion, and many forms calling for immediate attention in cases of recent peritoneal adhesion. I will not go over the subject as a whole, but will speak only of a few principles.

First, the cases of peritoneal adhesion calling for a correct diagnosis and proper care by the surgeon. Very many cases of peritoneal adhesion are cases in which credit for symptoms is given to some entirely different cause. We have as favorite fields for chronic peritoneal adhesion the region of the cecum and appendix, the gall-bladder, the sigmoid region, and the pelvis. From which group of adhesions do we get the greatest amount of disturbance calling for attention on the part of the surgeon? I think from the region of the gall-bladder; the bile tract. Why? Because in this region we are near the great solar plexus, and because the organs in the vicinity of these adhesions are more movable than the organs in the vicinity of the other common groups of adhesion. The effect of a liver which moves with every inspiration and pulls upon adhesions; the effect of a diaphragm which moves with every inspiration and pulls upon adhesions; the effect of the peristaltic movement of a stomach which is adherent at the pylorus, will give more

disturbance in the region of the gall-bladder and bile tracts than any other group of adhesions.

Next in the order of importance I believe to be the group of adhesions in the region of the cecum and appendix. And the reason why this group of adhesions seems to cause more disturbance than some others is because the peristalsis of the large bowel begins at this point, and the inhibition of peristalsis of the large bowel at this point gives rise to a train of symptoms and complications which become important in the concatenation.

Next in point of importance are the adhesions of the pelvic region, which, although extremely common, do not call for so much interference on the part of the surgeon as other groups of adhesions, for the reason that the viscera involved rest upon the pelvic floor and are not subject to such constant and varying degrees of friction.

Last of all in importance we have the adhesions about the sigmoid, which give rise to comparatively little disturbance. Aside from these common adhesion areas we have very many groups of cases with various points of adhesion of the omentum; points of adhesion of certain loops of bowel, various odd groups. But the four dominant groups are the ones which the surgeon should keep in mind most of the time when he is speaking of peritoneal adhesions in general, and he has to think of the bile tract group as the one productive of the most disturbance; of the greater number of disturbances calling for his attention.

The reason why we have adhesions so abundantly in the pelvis has been well worked out. We all know why we have adhesions so frequently in the region of the appendix. We know the reason why we have adhesions so commonly in the vicinity of the sigmoid. The latter were not well known until Robinson called attention to the fact that the psoas muscle caused traumatism of the fixed portion of the descending colon or sigmoid at that point, and he showed us the anatomical reason for adhesions there. The chief reason for the group of abundant adhesions in the region of the gall-bladder and bile tract is because we have a constant source of infection in the colon bacilli taken up from the bowel lumen by the lymphatics and bloodvessels of the bowel wall and carried through the portal system to the liver, excreted by the liver as still active

colonies of colon bacilli; so that they produce various catarrhs of the bile tract, and these catarrhs of the bile tract, caused by the colon bacillus on its way out of jail, are often very obscure. We call them acute gastritis, gastroenteritis, chronic hepatitis, malarial hepatitis, chronic malarial infection, biliousness; in fact, the list of names that go to cover these insidious bile-tract infections can be duplicated by the list of names we formerly gave to appendicitis. Just pick up all the things that were formerly said to be present in appendicitis cases when they were called everything else, and apply the names to these insidious infections of the bile tract, and you cover the ground.

Often we have to deal with these adhesions surgically, and I will make my remarks concise upon that point, simply referring to the surgery, the methods of surgery to be chosen in dealing with peritoneal adhesions occurring anywhere in the peritoneal cavity, but chiefly in the four regions named.

At first I employed the method of simple separation of adhesions. Just one moment before we get to that point; and let me speak of diagnostic location of the groups of adhesions causing reflex disturbance. That is a very important matter, and here my pair of points comes into play again. I refer, first, to that point an inch away on either side of the navel which marks a lumbar ganglion. If a patient is suffering, let us say, from nervous dyspepsia, and we suspect that there may be an adhesion element in the case, if adhesions in the pelvis are causing the chronic nervous dyspepsia, both of the lumbar ganglia will be tender on pressure. If we have adhesions in the appendix region causing the patient's dyspepsia, we have only the lumbar ganglion on the right side, an inch from the navel, tender on pressure. If the adhesions in the sigmoid region are causing the patient's dyspepsia, only the lumbar ganglion on the left side of the navel is tender on pressure. If the patient's dyspepsia is caused by adhesions in the bile tract region, or by eyestrain, a most common cause of nervous dyspepsia, then neither one of my pair of points is in evidence. These will be found to be of great practical importance in your daily office work. Just press on these little buttons and see what you bring out. In making a diagnosis of abdominal conditions you can sometimes feel all over the wall in the dark without touching the little electric button, but when you touch it the light is suddenly turned on. That is what happens with these points.

What are we going to do with these cases? There are instances in which patients suffer moderately from peritoneal adhesions that do not call for much surgical attention. But the patients may think that they do. In these cases we have to rule out the minor psychoses. Do not forget the importance of the minor psychoses. Throw hysteria into this basket, and neurasthenia. Take the whole basketful of job-lot diagnoses and call them all minor psychoses, and this group of minor psychoses must be recognized when we are to estimate the value of the symptoms in any case with peritoneal adhesions, because one patient will exaggerate the importance of a small adhesion tremendously and another patient will care little about adhesions that fill the whole peritoneal cavity. So the matter of nervous instability of the patient is a factor to be weighed in connection with the presence of the adhesions.

I have just seen one patient belonging to the fashionable circle in New York who had been in bed for two years with adhesions following a septic salpingitis. I did the second operation two years ago for the separation of adhesions. I used at that time Cargile membrane, covering large separated areas with this membrane, and told the patient that she would probably be up in four weeks. She had been two years in bed. I did not give quite enough weight to the patient's mental condition. She enjoyed being in bed. Her friends would bring flowers to her, relate stories, tell her things about the neighbors, so that she seemed delighted to stay in bed and did not want to get out. But she really wanted to play golf. Her only incentive was to play golf. When she tried to walk about she had a good deal of pulling still. I believed she had more adhesions. I operated on her a few months ago again at one of our popular resorts and found a little adhesion, about as wide as my forefinger and about one-fourth as long as my forefinger, hitching a loop of bowel to the region of the left broad ligament. One or two of her physicians said she would now be free from trouble, that she would get well. Another one, a consultant in the case, said no. He said the separation of a little adhesion like that would make no difference; the patient would not get well. I said, we will wait and see—a good, safe plan. I did not have to make a prognosis. The patient wrote me recently and said that she had not been so well for many years. She was up and all ready to play golf, fine and strong, with rosy

cheeks, all this being accomplished by an artistic twist of the wrist. One would hardly realize that such an unimportant thing as that slight adhesion would be such a factor in that woman's life. It was the pivot of her whole life.

As to the method of caring for adhesions, I first began by simply separating adhesions. We were doing that in the eighties. I was in Berlin and saw Martin rubbing separated adhesions with oil. I tried that for a while without getting marked results; then I followed the plan of filling the peritoneal cavity with saline solution after operation, and there can be no doubt that that plan has elements of value. But it is not wholly satisfactory, because the salt solution is absorbed too rapidly. Then I adopted the method of using the aristol film, because I noticed when we exposed raw peritoneal surfaces to the air there was a tendency for a lymph coagulum to form just as it did in the form of a glaze when we amputated legs in the older days. This glaze forms on the surfaces because the lymph coagulum has formed. If we include in the lymph coagulum an insoluble material like aristol, we include something which offers a mechanical obstacle to readhesion at that point. So this happened to be one of many things with which I experimented. I experimented with many different things. But the triiodide of thymol afforded the best mechanical protection; it made a smooth coagulum with the lymph and remained for I do not know how long in my rabbits. I kept the rabbits a year and found it was still present. But it undergoes slow absorption, due to solution by the fat in retrograde changes in cells. The normal retrograde change in surrounding cells gives rise to formation of fat, and this fat takes up a little aristol, so that in time it disappears in that way. It remains in this lymph coagulum as a mechanical obstacle to readhesion at that point for months and years, so that it proved an extremely satisfactory means for preventing the recurrence of adhesions except in the cases where there was oozing, as from a broad torn surface, and in such cases it would not be effective because it would not stick.

Now we can use other means for stopping this oozing temporarily, as suprarenal extract, antipyrin, ergot. We can stop the oozing long enough to apply our aristol and have the lymph coagulum form, and we do not care how much it oozes. That will stop the oozing. It is a good practical way to stop

extensive oozing. This lymph-aristol coagulum will hold it up. That is one way. Then I have used Senn's omental grafts in appropriate cases, and, finally, taking up the Cargile membrane, which is made of the sterilized peritoneum of the ox. I am now at work having some shark's peritoneum prepared for this purpose, because the shark's peritoneum can be obtained in large quantities and cheaply, and when we are able to fill the market with shark's peritoneum we shall all have this so-called Cargile membrane at hand for use cheaply. The Cargile membrane, simply prepared, is absorbed too quickly in many cases, and adhesion takes place at once, so that the patients are no better off than if it had not been used.

The experiments reported in the *Annals of Surgery* two years ago, and finishing with the statement that the Cargile membrane is not of value in preventing readhesion, were based on incomplete observation and upon observations on dogs only. Dogs are pretty bad animals to experiment upon, about as bad as horses, because of the ease with which peritoneal adhesions form, and after almost any sort of irritation, but there is much less tendency to permanent adhesion or adhesion from the irritation caused by the presence of a soft membrane like the Cargile membrane in rabbits and human species. I have found practically that in rabbits and in human species the Cargile membrane prevents the recurrence of adhesion very regularly, although sometimes not completely. Sometimes we may have to repeat the operation, and I have said to some of my patients with extensive adhesions, "We may have to operate two or three times upon you. We may not be able to do this all at once. We will do the best we can." And that is better than anything I have had before, with the exception of the aristol film. At this moment I am not willing to state whether I believe the Cargile membrane or the aristol film method to be the better of the two, but both are distinctly valuable in their proper places.

616 MADISON AVENUE.

PUBIOTOMY AND ITS RELATIVE INDICATIONS.*

BY

E. B. MONTGOMERY, M.D.,
Quincy, Ill.

My interest in the subject of pubiotomy, hebotomy, or lateral section of the pubis (extra median symphyseotomy) had its beginning from the fact that I was obliged to do the operation in 1903 to enable me to deliver a child which was impacted in the pelvis in a mentoposterior position. Examination of the literature of the subject showed me that no such procedure had ever been resorted to in this country for such a condition, nor had a lateral section of the pubis for any condition before been made on this side of the Atlantic. Satisfied with the outcome in this case I began a thorough investigation of the literature of the operation of Gigli, and presented this in a paper before the obstetrical section of the Fifteenth International Medical Congress held in Lisbon in April of this year. The results in the 134 cases collected by me from thirty-five different operators were uniformly favorable, there being no deaths whatever in cases not previously infected, and all patients recovering with perfect union of the bone and perfect gait.

The history of pubiotomy is directly connected with that of symphyseotomy, from which procedure it has been evolved and over which it now seems to be a very distinct improvement.

The possibility of enlarging the pelvic diameters by dividing the symphysis was demonstrated by Sigault in the dead subject in 1768, but not until the 2d of October, 1777, did an opportunity present itself of demonstrating its efficacy in the living subject. Mme. Souhot, the wife of a soldier, had had four very difficult confinements and no living child. Her only hope remained in a Cesarean section. This Sigault wished to avoid through a symphyseotomy, and the opportunity was given him. The woman accepted the proposed operation. Although for a long time after the operation the woman walked badly and suffered from incontinence of urine, still the promise given her of a living child was fulfilled. As might be expected, this fact excited great attention. The whole Parisian public was so interested in the matter that fashion sought to profit by it, and

*Read before the Mississippi Valley Medical Association, November 7, 1906.

gentlemen's cravats and hats *a la symphysis* appeared in the stores. Overwhelming enthusiasm on the one side and just as unreasoning skepticism on the other, often coupled with bitter personal invective, led to a strife which lasted through many years and found its expression in the camps of both the Cesareanists and the symphyseotomists.

The Academy had struck, in honor of Sigault and of LeRoy who assisted him in the operation, a special medal. The worst and far the most important opponent of Sigault was J. L. Baudelouque, who sought to demonstrate through experiments on the cadaver that the enlargement of pelvic dimensions achieved through cutting through the symphysis was unsatisfactory; rupture of the posterior joints resulted in every considerable separation of the bones; danger to life, lameness, lesion of the urinary bladder, suppuration of the joints and bones were brought forward, and principally, thanks to the zeal and authority of Baudelouque, symphyseotomy was proscribed in France, its cradle. Statistics published by Doederlein show that from 1777 until 1860 only 136 symphyseotomies were made: 46 were made in France, 56 in Italy, and 8 in Germany, all showing a maternal mortality of 36 per cent. Morisani collected 50 operations made between 1866 and 1887, with a maternal mortality of 38 per cent. Doederlein collected from 1887 to December, 1893, 278 symphyseotomies, with a maternal mortality of 11 per cent., corresponding with that given by Morisani on the subject in his report, given to the International Medical Congress in Rome in 1894. Rubinrot, in his "Study of Symphyseotomy," published in Paris in 1899, collects all cases reported up to that time, showing a 10 per cent. maternal mortality and a morbidity of 30 per cent. in those not dying from the operation.

Unquestionably, many of these operations were unjustifiable and were made where they were not indicated; still, the rate of mortality and morbidity has been too great as a result of this procedure. Gigli, in proposing a substitute in 1894, sought to present a linear osteotomy made through the pubic bone at a point where the soft parts would be less liable to damage and permitting of the same pelvic enlargement as the older procedure. The lack of union and defective gait, so often following the division of a joint, he has sought to replace by an aseptic linear osteotomy presenting the best possible chance for perfect union and unimpaired gait and offering the minimum of risk of

wounding the clitoris or urinary bladder. The statistics I am able to present to-day show that his idea was correct and that his procedure is a distinct advance over the one in vogue since its introduction by Sigault in 1777. As already stated, I had collected from the literature 133 cases with no maternal mortality in the cases which were aseptic before operation. Since that time Dr. Gigli has tabulated his second series of 100 cases with names of operators and numerous other details presented to Italian Society of Obstetricians and Gynecologists, September 25, 1906, with the same absence of mortality and perfect results as to the subsequent health and gait of the patient.

These superior results have won enthusiastic support for the procedure from Doederlein, Duehrsen, Reifferscheid, Seeligmann and others in Germany and the technic of the operation has been variously modified by them, making the operation either wholly or partly subcutaneous. I am unable to see any advantage over the small cutaneous incision made by Gigli preparatory to introducing his wire saw and dividing the bone.

Having established to your satisfaction, I hope, the superiority of pubiotomy or Gigli's lateral section of the pubis over the older symphyseotomy by statistics, which I have abundantly verified at a very considerable amount of labor, I can still add to that conviction by relating cases personally observed. My own case was a revelation to me; then I saw a case in Lisbon, Portugal, this 23d of April, in which the operation had been done by Prof. S. DaCosta Sacadura to facilitate delivery in a rachitic pelvis, one in Florence, Italy, in May, done by Prof. Antonio Giuseppe, for the same reason, and two in Cologne in June, done by Prof. Fritz Frank, director of the Midwifery School of the Rhine provinces, of a similar character. The relative indication for the employment of this method of facilitating delivery by enlarging the pelvic diameters is determined by its very low mortality (0 per cent. in cases aseptic before operation). It should require very little argument beyond the presenting of these series of cases with perfect recovery of the mother to make it evident that it should entirely replace symphyseotomy. If the series of two hundred cases given in detail are not sufficient, cases with the same results are rapidly accumulating. In a personal communication to me, dated September 26, 1906, Gigli says, "At present the

number of cases is 300, with an entire mortality of 2 to 3 per cent. It is interesting to observe that in the aseptic cases the operative mortality has been 0 per cent." Against this we must place the 10 to 11 per cent. mortality and 30 per cent. morbidity of symphyseotomy of even more recent statistics, those of Rubinrot and others.

Stoeckel urges as a possible advantage of symphyseotomy the greater enlargement procured by it, so that it may be used in pelvises with greater contraction. He contends that pubiotomy cannot be done with any success where the conjugata vera is under 8 cm., and that one is only able to secure by it 2 to 3 cm. separation of the bones. This is opposed to the statistics of dimensions given by Gigli, fully two-thirds of the cases collected by him showing a conjugata vera between 7 and 8 cm. Reifferscheid reports two cases in which the operation was done with good results with a conjugata vera of 6.75 cm., and Seeligmann also one successful case in conjugata vera of 6 cm. Leopold saw a separation of $1\frac{1}{2}$ to $\frac{1}{2}$ fingerbreadths, Bürger one of 2 and Doederlein one of 2 to 3 fingerbreadths, an equivalent of 4 to 5 cm. My own case gave a separation of fully $4\frac{1}{2}$ cm. Kroener saw a case in which there was a separation of a handsbreadth. The latter thinks the degree of pelvic enlargement is the same after either pubiotomy or symphyseotomy, and the experiments of Sellheim, Rosenfeld, Tandler, and Bill on the bony pelvis show the same results. So, leaving out of the question the comparative mortality, symphyseotomy should not be chosen with the idea of procuring more pelvic enlargement in the cases of greatly contracted pelvis—7 cm. or under. Pinard has urged that symphyseotomy is to be preferred because subsequent labors may be easier from permanent enlargement of pelvic diameters. Reifferscheid, Kannegeisser and Von de Velde have all reported cases in which the same result occurred after pubiotomy, and subsequent labors have been normal.

On every account, therefore, pubiotomy must replace symphyseotomy. The latter has absolutely nothing to make one favor it rather than the newer procedure. With the perfection of an operation on the mother presenting practically no greater mortality in competent hands than embryotomy, it would seem altogether unjustifiable to deliberately sacrifice the living child. In a few years it will be found that the Gigli wire saw and carrier will almost entirely replace the use of

craniotomy instruments, the latter being reserved for use only on the dead child.

What has been said of embryotomy may also be said concerning the induction of premature labor. There is a much greater mortality both of mothers and children in this operation than in pubiotomy, Winckel giving the maternal mortality as 5 per cent. and that of children born at from seven and a-half to eight months as 33 per cent.

An indication, other than contracted pelvis, for the performance of pubiotomy is the occurrence of an impacted mento-posterior face presentation in which a change of position cannot be effected by the Volland or other procedures. Here, in a case reported by me I did a lateral section of the pubis and terminated the labor by delivery of a living child with forceps, the mother making an excellent recovery. Prof. F. P. Pfannenstiel (Giessen) has advocated the use of this operation along with the production of premature labor at about 8 to 8½ months. The viability of the child is then greater and the risk from too great separation of the divided bones is avoided. This combination might indeed be made to replace entirely the old Cesarean section.

Prof. Frank, of Cologne, would not limit the performance of this operation to aseptic cases alone. In septic cases, in his judgment, the operation would add nothing to the mortality rate of already infected mothers, and might save many additional children. With regard to the technique of this operation very much has been written. The procedures divide themselves into three groups; the open method, the partly subcutaneous, and the wholly subcutaneous.

The method first suggested by Gigli, but first done by Bonardi, of Lugano, on the living subject in 1897 is as described by Gigli. "The incision which begins above in the middle line, extends downward and outward beside the labius majus to the lower end of the os pubis where one feels the subpubic tubercle. One cuts directly upon the bone, as with this incision one encounters no large blood-vessels. It is not necessary to dissect from the bone. Through the upper angle of the wound one brings the ligature carrier behind the os pubis. With two fingers of the left hand in the vagina controlling its course, it is pushed in back of the bone and out at the lower angle of the wound, beside the subpubic tubercle. With this instrument one

brings a large silk ligature behind the pubis and attaches it there. When one of the wire saws has been attached to one end it is drawn back of the os pubis and the bone sawed through with it. The pelvis opens easily—the hemorrhage is slight and easily controlled by compression. The clitoris, the urethra, the plexus of vagina and bladder remain entirely uninjured. The operation is completed." Van de Velde also makes use of the open method, varying the direction of his incision and carrying the ligature and saw from below upward instead of from above downward. Tandler makes an incision in skin beside the labium majus 3 cm. long, beginning $1\frac{1}{2}$ cm. from the lower border of the symphysis and running parallel with the ramus. He separates the subcutaneous fat in the direction of the free border of the pubis. He separates the corpus cavernosum and periosteum from the bone, ligates them, and cuts between. He passes the needle up next to the bone until it is on the side of the subpubic tubercle near the middle line, and pierces the rectus abdominalis. This method has been advanced as one by which it is practically impossible to injure the bladder.

Doederlein uses the partially subcutaneous method known by his name, making small incisions above and below, only large enough to facilitate the introduction and use of the saw. He sought by this means to present a smaller cutaneous wound and thus lessen the liability to infection.

Duehrsen has advocated a single puncture and carrying the ligature around the bone and out at the point of entrance. Reeb, an advocate of the method of Doederlein, criticises this method by saying that after the completion of the sawing process, the opening made will certainly amount to more than a puncture. L. Seeligman, (Hamburg), who first described this method, was followed by Waleher, Leopold, and Duehrsen in the advocacy of this subcutaneous osteotomy. He has devised a needle for the introduction of the Gigli saw, but in a later communication advocates the use of one devised by Bumm, which like a pedicle needle has the handle at a right angle to the needle proper, so that its direction is more easily and correctly controlled. If a strictly aseptic technic has been observed, results seem to have been equally good, whether the open or subcutaneous methods have been employed.

Dr. Jos. B. De Lee, of Chicago, while never having done the operation, has determined in advance that he would use Doeder-

lein's method. He would make a small horizontal skin incision over the pubic tubercle. He would introduce the finger behind the pubis to separate the bladder from the bone and to push up the head. The needle, armed with a silk loop, is carried around the bone, if possible, under the periosteum, and brought out in the large labium. By pulling the labium inward the opening in the skin is made far from the introitus, and is thus out of reach of infection by the lochia.

On withdrawing the needle the saw is carried around the bone by the silk loop and severs it by a few to-and-fro motions. The needle used is similar to a large Des Champ pedicle needle. Personally, I should prefer the small single incision made by Gigli, which can subsequently be sutured with catgut, covered with a small piece of iodoform gauze, sealed, and held in place by colloidion. The wound is then just as effectually withdrawn from the liability to infection by lochia as are the smaller ones made by Doederlein and Seeligmann. We have, in addition, the advantage of being able to effectually control all bleeding before closing the wound, and thus avoid the thrombi which have been troublesome in some cases done subcutaneously. The after-treatment is exceedingly simple in these cases. A simple girdle or strip of adhesive plaster encircling the pelvis has proved sufficient for immobilization in most cases. In Prof. Frank's clinic in Cologne not even this was used, the use of a trough-shaped mattress and the dorsal decubitus sufficing to keep the divided ends of bone approximated.

In conclusion, I can only say that I believe that pubiotomy has won a permanent place among obstetric operations, and that a near future will find it used in proper cases quite as frequently in our own as in continental countries.

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THE UTILIZATION OF THE BROAD AND ROUND UTERINE LIGAMENTS IN SUPRAVAGINAL HYSTERECTOMY.*

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(With two plates.)

ALTHOUGH what I may have to say upon this subject is original, I am not unmindful of the fact that other operators have worked along these lines.

I was led to put into practice the utilization of the broad and round ligaments of the uterus as a part of the finishing touch in hysterectomies by the subsequent distressing symptoms complained of by a few patients. In brief, these symptoms were continued pain in the pelvis, accompanied with a dragging sensation in the lower abdomen and back, together with vesical irritation to a marked degree, and in two cases unsatisfactory sexual intercourse due to a considerable shortening of the vaginal tube.

After a careful study of the etiology of these symptoms, I was led to believe that there was a just cause for suffering and that this cause was my imperfect technic; the manner of dealing with the stump of the uterus after the uterine tumor had been removed; in that the loose flaps of the broad ligament left hanging in the pelvis in no way held the stump in its normal position, and that in the process of cicatrization the site of the incisions healed and left a cicatrix approximately as long as the original cut surface of the broad ligaments.

When we consider the normal size and weight of the uterus, the natural intraabdominal pressure and the sustaining influence of the several sets of ligaments, we can appreciate to what extent the remaining portion of the uterine body has been robbed of agencies that nature intended should maintain it in its normal position.

Let us for a moment consider a case of fibromyoma of the uterus of considerable size and weight and of long duration. It

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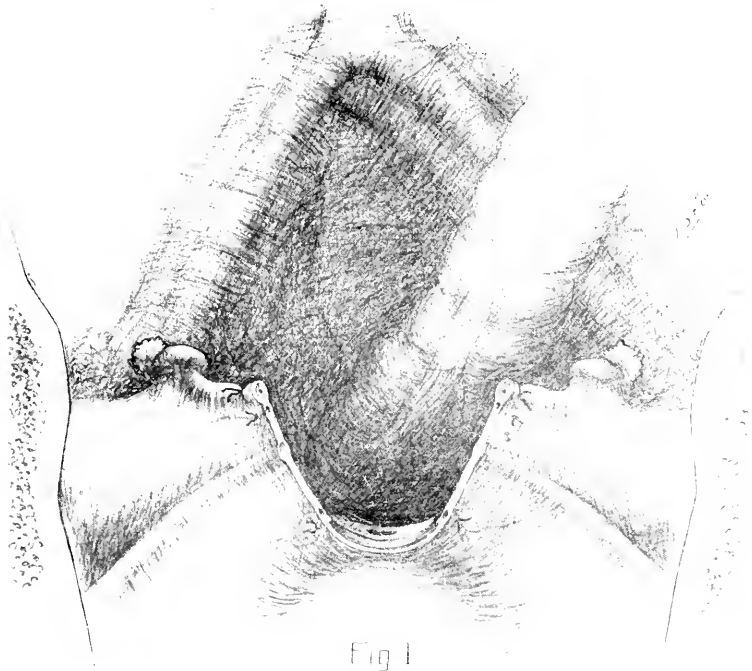


Fig 1

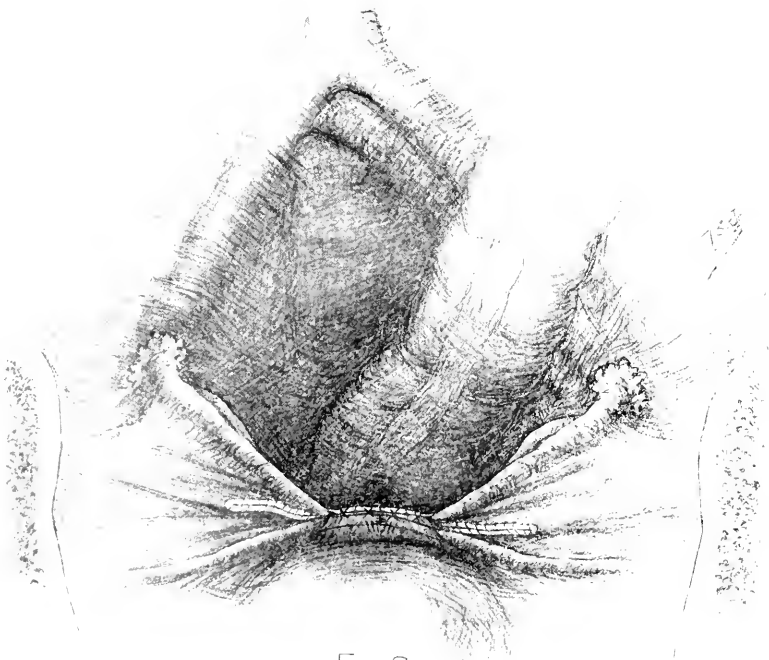


Fig 2

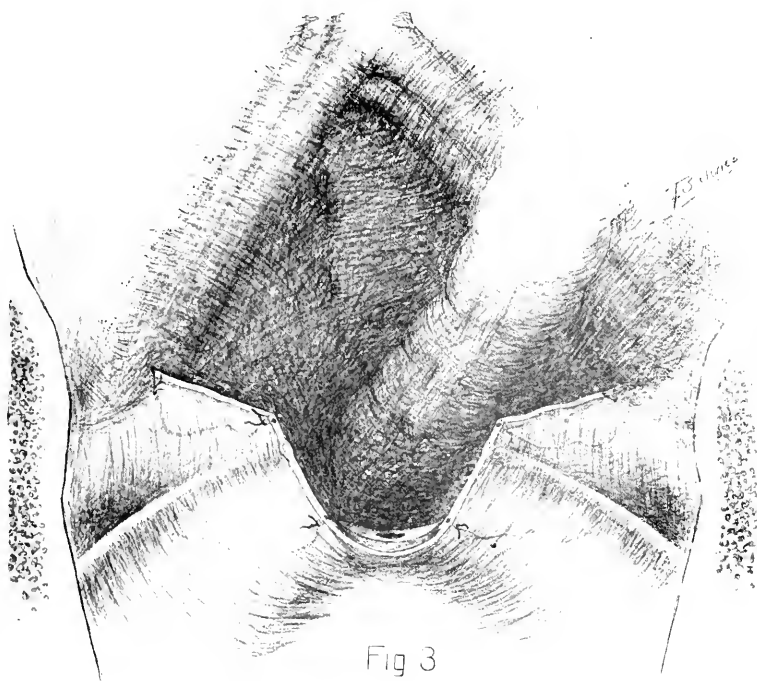


Fig 3

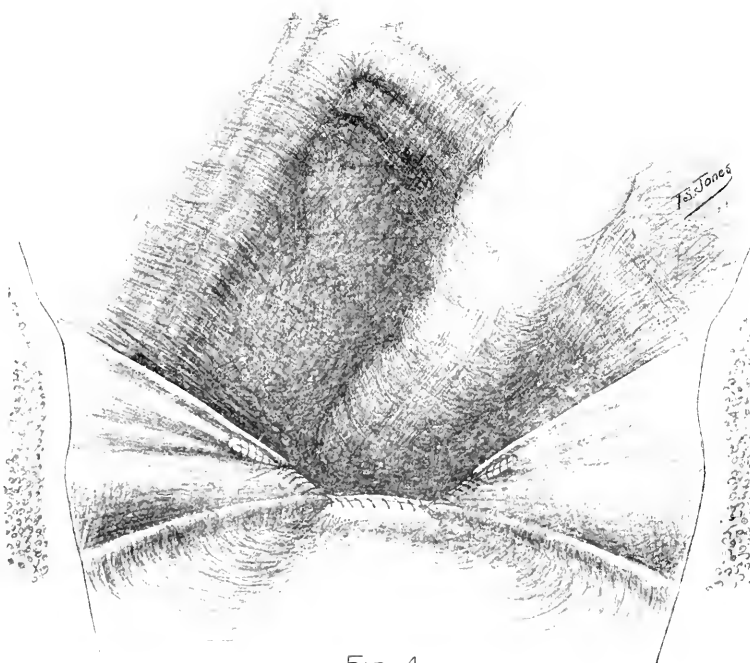


Fig 4

has, in its growth, encroached upon the normal territory of both the bladder and rectum, and by its pressure incident to its growth in all directions has by tension upon the superimposed peritoneum lengthened and stretched it, so that, when it is drawn together in the usual way by the surgeon for the purpose of covering all raw surfaces, it in no way acts as a support for the remaining cervical portion that has been left, and as a consequence it cannot sustain the stump in its normal position.

When it is considered wise to leave the ovaries, unless there has been some fixation of these organs, they are buffeted about in the pelvis and rendered susceptible to inflammatory processes.

Even when it is desirable to do a panhysterectomy, unless the broad and round ligaments or such portion thereof that are left, are brought into requisition there remains nothing to support the vaginal vault on its normally high level, and as a consequence, we occasionally have a distressing enuresis that cannot be relieved except perhaps by a second and more difficult operation.

Figure 1 shows the uterus removed and the line of incision passing from above downward on either side, the base of the bladder and the severed ends of the round ligaments. These severed ends of the round ligaments are now caught by artery forceps and drawn together and united by one or two stitches and then sewed to the posterior portion of the remaining uterine neck, as shown in Fig. 2.

In case the tubes and ovaries are left the proximal end of the tube is carefully covered with peritoneum and then stitched into the side of the stump on either side. The next and last step of the operation is the drawing together of the posterior and anterior peritoneal layers. In doing this either the button-hole or continuous suture is used. This is shown in Fig 4.

It can readily be seen that this brings the neck of the uterus into relatively proper position and also holds the bladder in a state of suspension so that its fundus cannot descend and sacculate.

The rectum, on account of its attenuated condition due to the previous pressure that has been long exercised, has a tendency to also sacculate, but by the stretching of the peritoneal lining of the pelvis it is held in position, so that the unrelieved constipation often following hysterectomy cannot exist.

CONTRACTION AND SHORTENING OF THE UTERO-SACRAL LIGAMENTS. A SUGGESTION AS TO ETIOLOGY AND TREATMENT.*

BY

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THIS paper embodies the results of personal observation in a certain number of cases of such a character as to lead me to consider the results worthy of confirmation or refutation by others, and it is with this desire that I offer this report.

On December 15, 1905, I read, before the Southern Surgical and Gynecological Association, a paper entitled, "Chronic Endocervicitis (Endotrachelitis), A New Method of Treatment with New Instruments," and the facts embodied in the following paper were incidentally observed in connection with my work on chronic endotrachelitis. Before coming to the original thoughts which I wish to offer for your consideration, I desire to consider the anatomy of the uterosacral ligaments and the commonly-held ideas as to this subject.

Thanks to the work of Bovée and others, our ideas, once of the vaguest, regarding the anatomy and physiology of these ligaments, has necessarily undergone revision. No one who has had operative experience with them, either from below, through the vaginal vault, or transperitoneally, can longer consider them merely as vague peritoneal folds dubbed ligaments by courtesy, as it were, but must realize that they are as definite and characteristic structures as are the round ligaments.

Rouget,¹ Testut² and Nagel³ all have stated long ago positively that they contained muscular tissue in sufficient amount to render them physiologically active, and I must agree that my operative experience leads me to believe that Deaver's description of them is the best considering its comprehensiveness and brevity. The muscular tissue is sufficiently abundant to be often spoken of as Luschka's muscle. Deaver's⁴ description is as follows:

* Presented at the Nineteenth Annual Meeting of the American Association of Obstetricians and Gynecologists, held at Cincinnati, September 20-22, 1906.

"The uterosacral ligaments are flat muscular bands, which extend from the uterus at the level of the internal os, beneath the layers of the rectouterine ligaments, to the sides of the sacrum, opposite the lower borders of the sacroiliac articulation. In the first part of their course they are in relation with the lateral walls of the pouch of Douglas and finally run on either side of the rectum near the junction of the sigmoid flexure and the upper portion of the rectum."

He speaks, in the above description, of the rectouterine ligaments, and referring to them on the preceding page (371, Vol. III), says:

"The false posterior or rectouterine ligaments, which are composed of peritoneum, are two single serous layers, which pass backward from the posterior surface of the uterus and vagina to the upper portion of the rectum, where they are continuous with the peritoneal coat of the rectum. These folds of peritoneum form the lateral boundaries of the pouch of Douglas. External to each of these false ligaments are found the true, or muscular, uterosacral ligaments, extraperitoneal connective tissue, and anastomosing branches of the uterine and hemorrhoidal vessels."

From these two quotations it is very evident that Deaver considers, I believe correctly, that the uterosacral ligaments are apart from and much more important than the posterior peritoneal folds, loosely but commonly spoken of as the ligaments. For a more detailed description of the sacral insertion of these true ligaments I would refer those interested to Bovée's⁵ description of them.

Granting the correctness of this anatomical description, it is easy to understand that the uterus may readily be actively drawn into the position known as retroposition, or retrocession, a position characterized by a drawing of the uterus as a whole far upward and backward into the hollow of the sacrum, and usually accompanied by a greater or less degree of ante flexion, by a contraction of the muscle fibers, Luschka's muscle, in these ligaments.

As to the prevalent treatment heretofore adopted, there have been three principal lines of treatment followed in addition to the "expectant." The great majority of physicians, especially the general practitioners, if they diagnosticated the condition at all, have relied upon various forms of tamponade, dependent for their action either upon the medication carried by the tamponade, or upon their method of bestowal of the individual component tampons. Also, in addition to

the tampon treatment some authors advise massage of the contracted ligaments. Turning, on the other hand, to their treatment of the relaxed uterosacral ligaments, one can but admire the absolute impartiality with which they also advise massage for this opposite lesion. It reminds one of the classes in the women's gymnasia, in which fat and lean women may be seen in the same class, taking the same exercises, some to get fat and some to get thin, and it is probable that here, as there, there must inevitably be a small percentage of successes, but not such as to enable any valuable conclusions to be drawn with reference to future cases.

The second faction have advocated and practised with moderate success, as I know from personal experience, but with a considerable percentage of recurrences, the vaginal section of the thickened, contracted ligaments.

The third, and smallest faction, have, following Burrage, cut the ligaments transperitoneally, through an abdominal incision. This procedure may, of course, be justifiable when the abdomen is already open for coexisting lesions but never for this condition alone. And not because this condition is not sufficiently distressing, because we all know that it is a very painful malady, giving rise occasionally to great disability, the symptoms having been so well considered by nearly all makers of text-books and many writers of papers, as to make a detailed description here a work of supererogation.

We are now to consider the question of etiology of contraction of the uterosacral ligaments. Among the older books, Thomas and Mundé⁶ gave no etiology whatever, except "pelvic peritonitis, often unsuspected by the patient." Dudley,⁷ in his edition of 1902, says: "The organ (uterus) may be drawn upward and backward by shortening of the uterosacral ligaments, which results from inflammation, and which usually induces a troublesome form of ante flexion." Montgomery⁸ speaks of shortening of the uterosacral ligaments as being due solely to inflammation.

So far as I can judge from my reading, the authors have been in harmonious agreement in believing that the cause of the shortening and coincident thickening of these ligaments, was due to peritoneal irritation in or near them, with fibrous overgrowth and consequent thickening. Here my observations lead me to an entirely different conclusion.

Wherever possible nature has made wise provision for rest as soon as any part becomes inflamed. The inflamed joint becomes more or less immobilized; in peritonitis the bowel becomes paretic, and other numerous illustrations might be cited. In health the uterus is extremely mobile, moving with practically every movement of any magnitude made by the upright body, especially in walking, stooping, riding, and the like, and in my work some years ago in measuring the effect of respiratory diseases upon the pelvic viscera,⁹ I was able to show to what extent the uterus must be affected and moved by normal respiration even during the hours of recumbency and sleep.

If, then, it is so mobile normally, we have reason to expect that nature has provided for its rest in disease. This we find to be true in all forms in which motion would be painful or harmful. For example, it is obvious that some forms of inflammation, in certain localities, would be much more benefited by immobilization than others. Inflammation affecting the peritoneal coat or the outer layers of the uterine musculature, or any part of the cervix, would be much more affected by movements of the uterus as a whole than would any inflammation of the corporeal endometrium. As a matter of fact we know that observation bears out this view. In metritis or perimetritis the uterus early becomes restricted in its mobility, but not noticeably so in uncomplicated corporeal endometritis.

Personal observation leads me to believe that in a certain proportion—I do not say all—of the cases in which the uterosacral ligaments are found contracted, thickened and sensitive to the touch, they are so as the result of an active contraction of their muscle fibers, the object of which contraction is solely the defence of an inflamed cervix, aiming to draw it upward and there fix it, so lessening its irritation by the ordinary bodily and respiratory movements and minor traumatisms. If, therefore, we take this view of the matter we see that, like so many other conditions once considered disease entities, this contraction of the uterosacral ligaments becomes only a symptom of some deeper trouble.

This defensive contraction usually is found in connection with one particular form of cervical inflammation, namely, endotrachelitis. Why it does not occur in all cases of swollen, eroded, lacerated cervices I have been unable to determine, unless it be due to the fact that such conditions are not usually

sensitive nor easily affected by traumatisms of a minor degree, and hence need such a defence less than does the sensitive, tender cervix of endotrachelitis.

If this contraction of these ligaments is merely the symptom of an endotrachelitis, it is obvious that the methods of treatment heretofore must fail of permanence unless the endotrachelitis is cured at the same time and if the trachelitis is so treated and cured it must be obvious that the contraction must subside without other, independent, treatment.

To illustrate both the nature of my observations and the results to be obtained by following the above line of treatment, and curing the endotrachelitis and disregarding the ligamentary contraction, I have chosen a typical and very obstinate case to report.

CASE.—Series IV, No. 265. First seen at the Out-Patient Department of the Free Hospital for Women, July 15, 1901. Aet. 24; married at 21; one child, lived seven weeks; one miscarriage, followed by curettage for hemorrhage; family and past history irrelevant and therefore omitted from this report. The physical diagnosis was laceration (slight) of cervix and perineum with *slight descent of the uterus*. Right tuboovaritis. Operation was advised and, the Free Hospital being temporarily closed, as is our custom each summer, she was operated upon by Dr. Burrage at the Carney Hospital on July 22, 1901, the lacerations being repaired and the right ovary and appendix being removed.

When next seen, January, 1902, at my clinic, she was entirely relieved of her former symptoms and had an excellent result from the plastic operation, but was suffering from a severe backache of a quite different and more intense character than that from which she had formerly suffered. The physical findings were: cervix and perineum well repaired, with good union; right side of pelvis negative; *uterus high up and well back, but in approximately normal axis*; left ovary high up and a little hard; left tube slightly thickened; marked endotrachelitis; both uterosacral ligaments shortened, thick and sensitive to traction.

From January, 1902, she was under practically constant treatment at my clinic, her symptoms apparently entirely dependent upon the contraction of these ligaments, and in spite of various medicaments applied upon various forms of tamponades, little or no effect, or at most temporary abatement of symptoms, was accomplished. During all this time the endotrachelitis had persisted although constantly treated. In September, 1905, I finally persuaded her to permit a cervical curettage in accordance with the technic and with the instru-

ments described in the above-mentioned paper upon chronic endotrachelitis,¹⁰ with the result that in less than two weeks she was entirely cured of all symptoms, the uterosacral ligaments were completely relaxed, the uterus once more normally mobile, and on sending for her during the past week (August 1906), eleven months after the cervical curettage, she reports herself entirely free from any recurrence of symptoms and the only departure from normal found on physical examination of the pelvis, was a slight, evidently transient enlargement of the left ovary.

The italicized portions of the above history are worthy of note. When first seen, in 1901, she had a right ovary so badly inflamed as to necessitate its removal the following week, and also appendical disease, we may presume, although the appendix may have been removed as a matter of routine. My own notes say nothing on this point. But at any rate, with this ovarian condition it would seem fair to assume the existence of a certain degree, past or present, of pelvic peritonitis, and yet the uterosacral ligaments were not contracted, but, on the contrary, were so far relaxed as to permit a slight degree of uterine descent. Seven months later, however, when the lining membrane of the cervical canal had become inflamed, although to be sure there was reason to believe there might still be some pelvic peritonitis, we first find these ligaments rigidly contracted so that at that time the characteristic ante flexion had become faintly suggested and afterward became decided, hence the uterus was drawn up from its former descent into a typical retrocession, thus producing the typical backache.

This, and many similar, though perhaps less marked, cases, in which the tampon and other treatments had not been so long and so faithfully used, but in which the cure of the endotrachelitis has been promptly followed by the disappearance of all contraction and thickening with the coincident sensitiveness of these ligaments, lead me to believe that in those cases in which contraction of the uterosacral ligaments and endotrachelitis co-exist, they stand in the relationship to each other of, respectively, effect and cause, the uterosacral contraction being actively muscular and defensive in its nature, intended to defend the cervix against movement and traumatism. The thickening in such cases as that above reported is due to the contraction of the muscular fiber, as it disappears promptly upon relaxation.

If this last assumption of relationship is granted as correct, the only successful remedy will be that which will most promptly remove the cause; and upon that subject I have fully expressed my views elsewhere. One other consideration, however, must not be overlooked. Two or more causes may be acting in coöperation and fibrous thickening of what Deaver calls the rectouterine ligaments may coexist with, or eventually supplant, the muscular contraction of the true uterosacral ligaments in which case orthopedic section and appropriate after-treatment of the ligaments would be necessary in addition to, or instead of, the above or any other treatment.

In conclusion I would again ask that the members of this Association do not consider the above as a dogmatic statement of fact, but as a suggestion of which I beg your confirmation or refutation.

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THE DIFFERENTIAL DIAGNOSIS OF SPLENIC AND
RENAL TUMORS.*

BY

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THE ever-advancing progress of abdominal surgery has made it incumbent upon those practising this art to become very conversant with things medical, and one of the most difficult problems to solve is a differential diagnosis of large tumors arising in the left hypochondrium. Of recent years much has been published relative to the surgical affections of the spleen, and the results have been so gratifying in most instances, that the diagnosis of maladies of this organ have become quite as important to the surgeon as to the physician.

Let us take, for example, a patient presenting a large abdominal tumor which has developed silently. The patient has probably complained of pain and a feeling of weight in the left side of the abdomen; he has lost flesh and strength. Other than this there is no precise symptom which can direct our search; there is no history of hematuria, no nephritic colic and no malaria. In examining the patient the first thing which will probably strike the clinician's attention is a bulging of the left hypochondrium and in some cases the ribs may be pushed outward, thus enlarging the diameter of the lower part of the thorax, while the left flank is also prominent. Now, if we look for any indications to be derived from the morphology of the growth, we should remember in the first place that when the spleen becomes hypertrophied it usually retains its shape. If one is dealing with a splenomegalia the tumor will be found flattened and elongated, having the consistency of the spleen and presenting a projecting border in which several indentations may be detected. This anterior border is sharp and distinctly felt, because it is in direct contact with the anterior abdominal wall and in some instances the fingers of the examining hand may be pushed under this

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sharp border with considerable ease and a sudden ending of the tumor will be perceived, the hand dipping down into the abdominal cavity. Such are the principal characteristics which most authorities have described in splenomegalia. We have also been taught that large spleens are quite regularly oval in shape, occasionally offering a characteristic crenulated border, and can be moved downward and inward in the direction of the umbilicus, but not vertically. Certainly in many cases by abdominal palpation one will find a large tumor appearing to emerge from below the left costal border, descending downward and inwardly toward the umbilicus. It can be easily circumscribed by the examining hand, its borders will be found rounded and hard, showing that the growth is oval in contour. By percussion dulness will be found over the tumor, which will extend up under the ribs even as high as the fifth. However, things are not always as thus described, because the spleen may be misshapen to such an extent that it may even take on the shape of the kidney.

Neoplasms of this organ are movable until they have reached a considerable size, but one can never elicit true ballottement, because these growths have never any contact with the lumbar region. By palpation friction may frequently be detected, indicating the existence of a perisplenitis. Renal tumors, on the contrary, are more apt to be round, their long axis being generally vertical, while in neoplasms of the spleen the long axis is oblique from above downward to the right toward the umbilicus. A very important diagnostic element is furnished by ballottement. The study of the development of renal tumors shows that, if their development forces them to extend toward the abdomen, they never lose their lumbar position; they become lumbo-abdominal and only become purely abdominal in those instances where renal ectopia has preceded the development of the tumor. These growths, which have retained their relationship with the lumbar region, or which can be made to re-occupy it, are more apt to be of renal origin, and, for this reason, it is not sufficient, for the simple reason that an abdominal tumor which can be mobilized by pressure over the posterior abdominal wall should be considered as giving rise to renal ballottement. It can be thus termed only in those instances where the pressure which gives rise to it has been made exactly in the costo-vertebral angle as near the apex as possible, which is the

absolute and only condition. But in those conditions which we have supposed present, that is to say a large tumor in the left flank, a renal neoplasm can come in contact with the abdominal wall and thus lose its distinctive characters of a renal growth. While still preserving its relationship with the lumbar region the tumor pushes the intestine aside and comes in immediate contact with the anterior abdominal wall. Ballottement, admitted as pathognomonic of renal tumors, may in the first place be difficult to elicit on account of the enormous size of the growth; or, on the other hand, it may be obtained in those cases where the neoplasm has not developed from the kidney. In point of fact any growth developing in the omentum, large intestine or spleen, if the tumor has a tendency to come in contact with the posterior abdominal wall at the same time that it develops toward the anterior abdominal wall, may give rise to ballottement. There is perhaps another necessary condition, namely, that, if the kidney is somewhat displaced downward, this displacement will then play a certain part in the production of ballottement, because the displaced organ acts as an intermediary between the hand which produces the shock behind and the extrarenal tumor which transmits it forward, but I cannot be affirmative in this respect. This sign is consequently not pathognomonic and it must be corroborated by other evidences of renal tumor, and all contradiction between the symptoms presented in a given case should render it at least suspicious. In one instance ballottement was distinctly found, likewise a tympanic area over the tumor, and a diagnosis of renal growth was unhesitatingly made, but at the autopsy both kidneys were found atrophied, while the gall-bladder was enormously developed. The presence of the intestine in front of the growth, which has been considered as an important distinctive symptom between renal growths and tumors of the gall-bladder, spleen and so forth, should consequently be looked upon with some little suspicion.

Palpation of such large growths can never lead to any definite conclusion and must be completed by other methods. If we consider for a minute the anatomy of the parts it will be at once recalled that the spleen is an intraperitoneal organ, while on the contrary the kidney is retroperitoneal. In the normal condition the spleen is in contact with the abdominal wall, and when it is enlarged from any pathologic cause this contact only be-

comes more intimate; consequently no intestinal coils are interposed between the abdominal wall and the growth, and dulness is obtained on percussion. A renal growth bounded behind by the ribs, muscles and aponeuroses of the lumbar wall cannot develop in this direction and consequently projects forward, at the same time pushing aside the intestinal mass. However, on the left-hand side, the growth may take on a thoracic development, pushing back the diaphragm and the spleen, and one instance has been related where a left-sided renal neoplasm reached as high as the seventh rib in the axillary line. By developing forward the kidney not only pushes the peritoneal layer covering it, but also the intestine forward. On account of its extreme mobility the small intestine may be pushed aside, but the same thing cannot be said of the descending colon, which is in immediate contact with the kidney and, to a certain extent, fixed to the anterior aspect of the latter. Consequently, in cases of left-sided renal tumor, a band of intestine will be found over it, which is nothing else than the descending colon. We consequently will get tympanism on percussion, if the gut contains air, but, if it is collapsed and flattened, dullness may be elicited, but palpation will reveal the presence of a body which rolls under the fingers. If sonority cannot be detected it may be made to appear by filling the gut with air by way of the rectum. This sign, however, is far less constant than has generally been supposed, because the colon may have been pushed outward on the side of the tumor, and this is what generally happens when the growth reaches any very considerable size. In one case of sarcoma of the kidney the colon was pushed outward and the growth became in direct contact with the abdominal wall. However, when the sonority is present it is very important, because in principle it indicates that the tumor is retroperitoneal.

But splenic tumors, ordinarily in direct relation with the anterior abdominal wall, may, on account of adhesions, or an abnormal development, be separated from the latter by the intestine, and in one case, where the presence of a left-sided abdominal tumor was evident and by palpation the anterior border could be distinctly made out, the condition was diagnosed as a splenic tumor and nevertheless there was marked sonority in front of the tumor. This sonority may be present if the growth starts from that part of the internal aspect of the

spleen which is situated behind the hilum, and it will then consequently push the greater cul-de-sac of the stomach forward and likewise the angle of the colon which is attached to the spleen, and an extensive sonority will be present. However, this does not present the same characters as in the case of a renal tumor, because it is diffuse and does not resemble an intestinal coil, which is often appreciable to sight and to touch, and which obliquely crosses the anterior aspect of a renal tumor.

In cases of splenic growths the tumefaction has a greater tendency to project toward the anterior abdominal wall than into the lumbar region, and percussion may elicit dulness extending up the lateral aspect of the thorax, leaving sonority in the lumbar region, while the essential character of renal dulness is to continue with that of the vertebral column without any interruption. Certain English authorities have been supposed to have found a distinctive symptom for splenic tumor, and according to their way of thinking the presence of a sonorous band seated between the lumbar part of the vertebral column and the tumor would be in favor of a neoplasm of the spleen. However, the results obtained by lumbar percussion are not precise, and when this region is percussed in a patient where the kidney has been removed no difference can be found between the two sides. Nevertheless, this sign should be looked for and when it is distinctly in evidence a certain importance may be given to it. In one case where sonority was found separating the dulness obtained by percussion of the tumor and that of the vertebral column little importance was attributed to this fact, because the diagnosis of a renal tumor had been made, but in reality when the patient was operated upon a hydatid cyst of the spleen was found.

From the results of percussion we may, however, conclude that if a sonorous band is found in front of a large abdominal growth our presumptions should be in favor of a renal neoplasm, but if dulness of the tumor continues directly backward with that of the vertebral column we also have here a sign which is distinctly in favor of the growth being of renal origin. If we auscult the growth we may obtain a sign that palpation has already given—namely, one will hear friction sounds which indicate perisplenitis. It has also been said that in cases of splenic tumor auscultation may give rise to a souffle, but in those cases that I am familiar with this sign was absent. If we resort to

the phonendoscope, we can combine auscultation and percussion. The percussion is realized by a series of superficial frictions and not by a series of shocks. This friction gives rise in the organs subjacent to the cutaneous zone which is the seat of them, to vibrations which vary according to the consistency of the viscus considered, and consequently one may outline an organ by ascertaining the limit of the propagation of the vibrations which are communicated to it. This method has been applied with excellent results and by its use it is occasionally easy to exactly map out the contours and the size of the various abdominal viscera and to very exactly localize the seat and connections of a given neoplasm. Although there is considerable difficulty this method has certainly given very excellent results, and in one case reported by Albarran a diagnosis was made in a child whose large spleen had led one to believe that the case was a malignant renal growth, but by this process he was able to map out the contours of the kidney which were found normal. I have, however, resorted to this method on several occasions in cases of left-sided abdominal tumors, and I must confess that the result has been disappointing.

Puncture of the growth does not always enable us to come to any exact conclusion and, although it may indicate whether the tumor is solid or liquid, it will rarely allow one to diagnosticate the seat of the growth. However, if fluid is withdrawn, the renal nature of the liquid can be ascertained by analysis, but it is well-known that the fluid contained in cases of long standing hydronephrosis usually no longer contains urea, while uric acid and the extractive materials of the urine have likewise disappeared. Exploratory puncture will, however, allow one to make the diagnosis of hydatid cyst, while the color of the liquid removed, the presence or absence of urea, uric acid and the microscopical examination for hooks of the echinococcus will allow one to make a differential diagnosis between the former and an old hydronephrosis. If, on the other hand, exploratory puncture only results in the withdrawal of blood it is probable that one is dealing with a solid tumor, but nothing more than this can be affirmed. Consequently, to sum up, it may be said that exploratory puncture will rarely allow one to establish or confirm a diagnosis, and since it is far from being free from danger, it should rarely be resorted to.

We now come to a group of signs of great value and, although

they are not always of the greatest, they are at least frequently quite equal to those which have already been studied and it is to these that recourse should be had in difficult cases; I refer to the study of functional disturbances of the spleen and kidney in order to localize the seat of the growth. It should, however, not be assumed that a diagnosis of the case can always be made by this means, but what can be done is to localize the seat of the growth, either in the kidney or the spleen, after which the nature of the disease remains to be discovered. Of pain and various symptoms of compression I have little to say, because they present nothing that is pathognomonic, but I am desirous of especially insisting on a very important symptom of compression—namely, varicocele, and then upon the condition of the blood and the urinary function.

Pain is a frequent symptom and all subjects the possessors of large abdominal tumors will of themselves call the physicians' attention to this symptom, which is often the first one noted. In renal neoplasms it is produced by dragging of the tumor, adhesions and compression of the nerves of the region. The pain is more or less sharp and may be either continual or paroxysmal and is seated in the lumbar region and the hypochondrium. From here it may radiate toward the testicles, the thigh and intercostal spaces, so that it may simulate the lightning pain of tabes. Such pain is easily explained, being produced by compression of the lumbar and sacral nerves, thus giving rise to extension to the lower limbs. Pain is met with in splenomegalia, but more frequently the patient complains of a sensation of dragging or of weight, while paroxysms occur resulting with the intercurrent attacks of perisplenitis. The seat of this pain varies; it may simulate intercostal neuralgia, or it may be localized in the abdomen or in the left shoulder or scapular region, this being the case when the tumor is in close contact with the diaphragm or bound to it by adhesions. Splenomegalia generally has a more marked thoracic development than a renal neoplasm; it pushes up the diaphragm and the lung, and oppression or dyspnea is the natural consequence; the left lung may be even pushed so far up and the heart deviated to the right of the sternum so that dyspnea becomes very violent and interspersed with attacks of oppression.

When developing into the abdomen the growth gives rise to digestive disturbances, such as dyspepsia, nausea, vomiting,

gastric pains and constipation; the patient complains of intra-abdominal weight and dragging. Palpation will sometimes awaken the pain, but in some instances other than when the patient is examined there is little suffering.

The development of these large tumors does not undergo its evolution without giving rise to other symptoms of compression, but the larger number of these have nothing which is characteristic, and although splenomegalia is more apt to give rise to dyspnea, oppression and digestive disturbances, renal tumors perhaps more frequently produce compression of the vena cava resulting in edema of the lower limbs. But among these symptoms of compression there is certainly one possessed of great value, and whose presence, although not being pathognomonic of a renal neoplasm, will certainly be a very strong presumption in favor of this diagnosis; I refer to varicocele. A number of authorities have mentioned this symptom and the majority think that it is a symptom greatly in favor of a renal growth, especially when this varicocele is of recent date and at the same time of its appearance the patient has complained of pain on the left side of his abdomen. Consequently when dealing with a recently developed varicocele one should always examine the renal region on the corresponding side, even when it is seated on the left, because it is well known that varicocele is very frequent on the left for several reasons. The left spermatic vein is somewhat longer than the right; it is compressed during its passage through the pelvis by the iliac portion of the colon, it also encounters the renal vein at a right angle—all of which cause a certain hindrance to the passage of blood through it. Generally speaking, the varicocele only arises when the tumor has become very large, but Legueu, who, by the way, attributes this symptom to the involvement of the lymphatics with their resulting compression of the spermatic veins, mentions the following case where autopsy only showed a small neoplasm the size of a walnut.

The patient presented three symptoms—namely, hematuria, varicocele and a left-sided lumbar growth. A diagnosis of carcinoma of the left kidney was made and an exploratory laparotomy done in order to ascertain the size and connections of the tumor. During the operation it was discovered that the spleen alone was increased in size, while the kidney appeared intact. The patient died two days later, and at the autopsy a focus of

cancer was found in the left kidney with enormous masses of lymphatic glands along the vertebral column, which compressed the spermatic vein. This case consequently shows that there is no relation between the size of the tumor and the production of the varicocele, the latter being merely an external manifestation of secondary lymphatic involvement.

Such, however, is not the unanimous opinion, and Heresco found that varicocele was absent, although the hilum had been invaded by the large glands, while, on the other hand, he has met with cases of varicocele where the lymphatics were not enlarged. In a case related by Morrestin varicocele was present and, although a transperitoneal nephrectomy was done, it was impossible to discover any large glands, the patient recovered and the varicocele disappeared. In a case reported by Albarran of a large left renal tumor having given rise to a very large varicocele on the same side, lumbar nephrectomy was done, and during the operation no enlarged glands could be discovered in the region of the hilum. The day following the operation the varicocele had disappeared. The patient died and autopsy failed to reveal the presence of any lymphatic enlargement. In a case reported by Giauffer the patient lived nineteen months after his operation, during which time the varicocele did not reappear. It matters little about these various findings, whether the varicocele was produced by compression resulting from enlarged glands at the point of entrance of the spermatic vein in the renal, or whether the tumor itself was the cause of this compression, because, as far as we are concerned, it is merely a question as to whether or not much importance should be given to this symptom. Now, I believe that it is important if the varicocele is of recent date, but I do not believe that it is a pathognomonic sign of renal growth, still if it becomes added to other symptoms it will make the balance weigh in favor of this diagnosis. Varicocele has been found in cases of splenic neoplasm, such as primary tuberculosis of the spleen and so forth, and Chauffard points out that a splenomegalia of any nature will not in itself compress the renal and spermatic veins, or the pampiniform plexus, but when the nature of the lesion is either cancerous or tuberculous the lymphatics become involved and by their enlargement produce the pressure. In cases of renal neoplasm the presence of enlarged glands is not necessary for the production of varicocele, the tumor alone being sufficient.

If the occurrence of varicocele in itself cannot affirm the presence of a renal tumor unless an abdominal tumor is found which corresponds to the kidney, it at least indicates that one should, in the first place, explore the corresponding kidney and will thus put one on the track of establishing a correct diagnosis. Although one should not forget that other growths may give rise to this symptom, it nevertheless is a sign of very great value in favor of a renal localization of the growth.

Let us now continue other points in the diagnosis, because as yet we have not been able to establish an absolutely certain diagnosis by the methods so far considered. Knowing the normal functions of the kidney and the spleen, one should ascertain if, when these organs are the seat of a lesion, their functions are disturbed, and it is probable that these rather delicate investigations will allow us to come to a conclusion whether the kidney or the spleen is the seat of the affection. In the first place, let us consider the urinary function. The twenty-four hour urine has been collected in order to ascertain the total amount, while the presence or absence of albumin or pus is noted. After having centrifuged the urine red blood cells should be looked for, likewise Koch's bacillus, recalling to mind that this bacillus is usually present in very small numbers in cases of renal tuberculosis.

It is very evident that if the urine is purulent and contains either the bacillus of tuberculosis or red blood cells further research is unnecessary, because all this signifies that the kidney is the seat of the trouble. But if these clinical signs are wanting and the twenty-four-hour amount of urine is normal, we should continue the examination. The examination of the urine secreted by both kidneys is necessary, but can give no indication as to the lesions that one of the two urinary glands may be the seat of. A patient may void a normal quantity of urine and a total amount of extractive matters may be increased so that nothing in the examination of the total quantity of urine can lead one to suppose that one of the kidneys is functionally destroyed. This examination is only of use when the diagnosis of a renal neoplasm is evident and it then allows one to conclude whether or not the other kidney has retained its normal function. It is only by a separate analysis of the urine coming from each kidney that the seat of the tumor may be known to be in the kidney by noting the diminution or absolute cessation

of the secretion on the diseased side, or else some change in this secretion. In a general way it may be admitted (1) that in a given time both kidneys secrete different quantities of urine, whose composition is also different; (2) the difference between the quantity of urine secreted by each kidney during half an hour may vary between 10 and 40 per cent.; (3) this difference becomes attenuated in direct proportion to the length of time; (4) there is a law of compensation according to which the kidney furnishing the largest amount of urine secretes a liquid of lower specific gravity. In order to deal with this condition of affairs the examination should be prolonged and we have numerous means at our disposal for ascertaining whether or not both kidneys are functioning, and these means will allow us to make a precise and sure diagnosis. I refer to cystoscopy, ureteral catheterization and intravesical separation of the urine.

Cystoscopy shows the condition of the bladder and the aspect of the ureteral orifices and the way in which the urine is ejaculated from the ureters into the bladder. However, catheterization of the ureters may be done, but a more simple way which may be resorted to by everybody is intravesical separation of the urine. Certain bladders may be pathologically changed so that separation is impracticable, or the presence of a stricture may prevent the introduction of the instrument, but in this case there is no reason why the lesion should not be dilated so that the impossibility will be done away with. Of course, this method cannot be used in children on account of the small caliber of the urethra. This method is of considerable importance, and in the cases which we are now considering there will usually be extensive anatomic changes throughout the entire renal parenchyma, so that the functions of the diseased organ will be considerably interfered with. For example, the diseased kidney will secrete less urine and the quantity of urea contained therein becomes diminished.

Albarran has studied the elimination of methylene blue in cases of renal neoplasm, and in one case the elimination by the diseased kidney occurred under the form of chromogen during the first twenty-one hours and after this up to the fifty-second hour the urine contained both methylene blue and chromogen. Cryoscopy of the urine secreted by the diseased kidney has also given rise to much experimental work, and in one case reported

by Albarran the point of freezing between the two specimens showed that in the diseased kidney it was 0.70 and in the healthy kidney it was 1.48. Here then the lowering of the freezing point of the urine shows the marked functional changes of the diseased kidney, which is shown by the lesser molecular concentration of the urine. Consequently, in kidneys the seat of malignant change the parts of the organism which are free from the neoplastic invasion are nevertheless decidedly diseased and functionally weak.

In cases of renal tuberculosis with obstruction, separation of the urine shows absolute absence of urinary secretion on one side and the same may be said with closed pyonephrosis, but in this case the patient will give a history of urinary symptoms, a rise in temperature, gastrointestinal disturbances, which will leave no doubt as to the character of the lesion.

The examination of the functions of the spleen are quite as important, and if the neoplasm has developed in this organ, it is more than probable that its functions will be disturbed. Consequently, in order to ascertain this point, it is to blood examination that one should resort to in every case of splenomegalia.

Carcinomatous leukocytosis has been the object of study and has been especially met with in generalized sarcomatosis. In one case of sarcoma of the bone the blood count showed 50,000 leukocytes, while in a case of carcinoma of the thyroid the count showed 70,000. In one case of sarcoma of the kidney with metastasis in the lungs and liver, blood counts showed 25,000 white cells, while the red cells were considerably reduced in number. This anemia with leukocytosis in cases of malignant growth is common and is more or less marked, and when it reaches a high degree it is the most prominent symptom presented by the patient. The formulæ of the blood counts are as yet not definitely settled, and, although the polynuclears are far more frequently met with, still mononuclears may occasionally be encountered. In tuberculosis the presence of a leukocytosis can no longer be discussed, at least in certain forms and at certain periods in the evolution of this disease. It has also been shown recently that the number of leukocytes varies very considerably from day to day or even during the day itself, a fact which explains the discord of authorities on the existence or absence of leukocytosis in these cases.

A considerable increase in the leukocytes belongs especially to leukemia and when their numbers reach beyond 70,000, it is practically pathognomonic of this pathologic process. Some instances of this affection have been recorded where the number of white cells was lower and in reality the diagnosis of leukemia cannot be made affirmative until the abnormal types of cell, described by Ehrlich, have been shown to exist in the specimen. There is another form of splenomegalia which should be considered; I refer to primary tuberculous splenomegalia, and it may be said that of all the abdominal organs, the lymphatic glands being excepted, the spleen is the most frequently affected by tuberculosis. Blood examination in these cases is of great diagnostic value, but instead of anemia there is a great increase in the red cells to such an extent that in one instance there were 6,200,000 red cells for 6,000 white and in another case the count showed 8,200,000 reds and 31,425 whites. This condition of the blood may, however, not always exist and in several reported cases a slight anemia has been found. However, when in presence of a large tumor occupying the left hypochondriac region, if the red cells are greatly increased, one should immediately think of tuberculosis of the spleen, but it must also be remembered that this pathologic process does not always give rise to an increase in the red cells.

Since this is the case the question arises as to how one should make a diagnosis of tuberculosis of the spleen. The use of tuberculin is generally admitted, I believe, to be dangerous, and perhaps a latent tuberculous process is better detected by sero-diagnosis, although this procedure is certainly open to many errors. The specific bacillus of tuberculosis may be searched for in the blood, although not much hope can be placed in this, and even should the organism be found it would only show that a tuberculous process existed, but it would not tell us whether it was in the kidney or the spleen when the tumor is situated on the left-hand side, and it would be only in favor of a localization in the spleen rather than in the kidney in those cases where a urinalysis remains negative.

In order to complete the diagnosis one should take into consideration the examination of the other viscera, the patient's general condition and his antecedents. Now, it is well known that lesions of the spleen generally react upon the liver, so that this organ should be carefully examined, and, if it should be

found increased in size, which is generally the case, our pre-sumptions may be in the first place in favor of a splenomegalia, but it should not be forgotten that in some cases the liver is normal, it does not reach below the costal border, while blood examination may prove beyond a doubt that the case is one of myelogenous leukemia. An increase in size of the liver may lead one to an erroneous conclusion by corroborating other symptoms pointing to splenomegalia. Thus, for example, in one case, there was a considerable increase in size of the liver, the organ measuring 14 centimeters in the mammary line and this sign was in itself enough to almost show that the diagnosis of tuberculous splenomegalia was correct, when in reality the autopsy showed that the increase in size of the organ was due to a neoplasm.

In the primary splenomegalia of Debove and Bruhl in Gaucher's disease and in primary tuberculosis of the spleen this same increase in size of the liver is met with, and in these cases one should look for other signs which belong to these various affections, although it must be admitted that the difficulty with a differential diagnosis is very great. In some instances, which are most infrequent, however, the liver will be found reduced in size—in other words, atrophied. In this case examination of the liver will show anemia without leukocytosis, and in spite of the hepatic atrophy the patient will not present any symptoms of cirrhosis, but it is only at the very last period of the disease that symptoms of atrophic cirrhosis will show themselves, and under these conditions the diagnosis of Banti's disease can be made. This diagnosis is most important to make, because upon it will depend the life of the patient and the treatment, because splenectomy performed in time will rescue the patient from death. Extirpation of the spleen results in a radical cure, and if there is a commencing hepatic cirrhosis, splenectomy may prevent its development and bring about a complete cure. Banti's disease, when left to itself, or to the resources of medical treatment, is fatefully mortal.

For this reason any secondary involvement of the liver should cause one to direct his researches to the spleen and cause the diagnosis to be in favor of a lesion of this organ, just as in the case of a rapidly developing varicocele one should at once think of a renal lesion and examine the kidney on the side upon which the varicocele is seated. Be it understood that I am not con-

sidering the numerous cases where a hepatic affection has distinctly anteceded the other symptoms and has given rise to splenomegalia.

After having gone so far the condition of the peripheral lymphatics should be ascertained and when large masses of glands are found in the neck, axilla or groin a large spleen may also be made out with or without leukemia. These lymphatic hypertrophies produce very marked functional disturbances, while hypertrophy of the deeply seated glands produces functional disturbances still more marked, such as icterus, ascites, edema of the lower limbs; the disturbances produced by enlarged mediastinal glands consist of dyspnea, cough, changes in the voice, disturbances of the pupils, and the like.

If one is dealing with a renal tumor of sufficient size to simulate a splenomegalia, he should recall to mind that in order to reach such a size the tumor is very probably a sarcoma and it is known that under these circumstances generalization of the process takes place by the way of the blood, very rarely by the lymphatics, and that consequently the lymphatic system will be found intact.

Examination of the lung by giving evidences of a tuberculosis undergoing its evolution and confirmed by the presence of the specific bacillus in the sputum and inoculation in guinea pigs, is certainly in favor of a tuberculous splenomegalia, but it should not be forgotten that in this disease the bacilli will remain inclosed within the spleen for a long time, and that the most attentive examination will fail to reveal the presence of Koch's organism anywhere. In one case a pulmonary tuberculosis was supposed to exist when in reality the symptoms presented were due to a generalization of a renal sarcoma.

Examination of the heart in anemic subjects, may show the presence of a murmur, especially at the apex, and this will also be encountered in the vessels of the neck, preferably in cases of leukemia.

Speaking of the functional signs I spoke of intravesical separation of the urine and the examination of the urine secreted by each kidney, and I will now consider whether or not in the total amount of urine excreted some change may exist which will cause one to diagnose one disease more than another. It has been shown by Rommelaere that in malignant disease the amount of urea becomes diminished, but then again this decrease is met

with in many diseases. On the other hand these patients are confined to bed, their appetite is poor and their digestive tract in bad condition, so that the decrease in the total amount of urea can be readily attributed to these defective conditions. In the case of leukemia the urine is voided in small amounts; it is very acid and occasionally contains very large quantities of uric acid, while the urea is diminished. In the physiological condition the twenty-four-hour amount of urine should contain 50 centigrams of uric acid, while in leukemia the total amount may reach 3 grams or even more. In one case of sarcoma of the kidney the amount of uric acid eliminated in twenty-four hours amounted to 2 grams and 53 centigrams. In all these cases the antecedents of the patient should be carefully gone into, never forgetting the possibility of malaria, and one should also ascertain the record of tuberculosis in the family of the patient and whether or not at any time he has presented evidence of tuberculous infection.

In leukemia the patient is extremely pale, the mucous membranes are without color, while the skin is dirty white. Strength is rapidly lost and the patient should become incapable of making any effort, and at the same time he is subject to vertigo and buzzing in the ears. Auscultation of the vessels of the neck reveals a murmur, while the pulse is rapid and soft. The lower limbs are the seat of slight edema, temporary in the first place, but which later on becomes more marked and permanent. Hemorrhages are common and frequently severe, often resulting fatally. The slightest prick is followed by a considerable loss of blood. Temperature is raised at night. It has been pointed out that generally speaking tuberculous splenomegalia gives an entirely different look to the patient, whose color is bright red, or even blue. In Gaucher's disease, the general health is rapidly compromised, the patients becoming rapidly anemic and thin. In cases of renal tumor the subject also becomes cachectic, but the progress is slower and he does not offer this pale white tint, but rather a straw color hue of the integuments, while loss of flesh is extreme. These patients die of cancerous cachexia, or from generalization of the process, while renal insufficiency is exceptional. If the tumor is a hydronephrosis or a hydatid cyst the general condition of the patient remains intact for a considerable length of time and it is only at a later date that certain complications will begin to show their effects. Pyone-

phrosis and tuberculosis give rise to elevation of temperature and leave no doubt as to the suppurating character of the lesion and which the etiology in itself will allow one to suspect.

871 BEACON STREET.

PROLAPSED OVARIES.

BY

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(With one illustration.)

IN the development of gynecology, the removal of large fibromyomata, the wide dissection to remove carcinoma and the wandering away after things in the upper abdomen, has consumed so much time and work that the small but discomfort-producing prolapsed ovary, has been overlooked. And its neglect has left many patients in needless pain and brought discredit upon the attending surgeons.

A brief outline of the history of one case can be used as an illustration of quite a large class.

(574) E. W., aged 16 years, was admitted to the City Hospital early in October, 1905. She was first in the care of the internal medicine department, where a careful history and complete physical examination revealed no pathological lesion. She was transferred to the gynecological side October 7. She had never been pregnant. She began to menstruate at 13 years of age, and the periods have recurred regularly, with a duration of from three to five days, and always painful. The pain precedes the flow about one week, and continues for one week after the flow. The pain is in both sides of the pelvis and in the back, and there is severe occipital headache.

Since June the attacks of pain have come on independent of the flow every two weeks. During some of these attacks of pain she has violent hysterical convulsions lasting from ten to twenty minutes, and which leave her very weak. The convulsions are always preceded by the pain, so that she is able to know when they are coming on.

A bimanual examination under anesthesia was made and a re-

troverted uterus with both ovaries in the cul-de-sac were found. The patient was quite anemic, but no other gross lesion than the one mentioned was detected.

The abdomen was opened, the ovarian ligaments shortened, bringing the ovaries up close to the posterior side of the uterus, just behind the region of the Fallopian tube, on either side.

The postoperative history is uneventful. She called upon me in August, 1906, and states that she is getting along well, and has had no return of the nervous attacks, and is free from pain.

Causes: A very large proportion of prolapsed ovaries occur in association with retrodisplacements of the uterus, and when we take into consideration the frequency of retrodisplacements, and the fact that about twenty-five per cent. of all of them are congenital, one of the most prolific causes of prolapsed ovaries is accounted for.

Another condition found is that nearly all prolapsed ovaries are enlarged. We are compelled to consider whether the enlargement is a cause or a result of the prolapse. There is no doubt that in part of the cases the enlargement comes first and is the direct cause of the prolapse, the suspensory ligament becoming elongated by the constant dragging.

On the other hand, the enlargement is so constant that there must be some direct relation between the increase in size and the increased congestion resulting from the displacement. The enlargement in some cases is an actual increase in ovarian tissue; in many the enlargement is due to a cystic condition.

The direct cause of the prolapse, both in the cases associated with retrodisplacements, but more particularly in those in which the uterus retains a normal position, is the elongation of the ovarian ligament, which should hold the ovary fairly close to the fundus of the uterus.

Symptoms: These patients present a series of symptoms which occur with a sufficient degree of regularity and frequency to present a fairly clean-cut clinical picture.

Pain in the pelvis is one of the most constant complaints; very commonly it is located in both ovarian regions, and in some instances in one side only. At times it radiates down one or both legs, and is invariably increased by the patient being on her feet. This pain is sometimes so severe that the patient cannot be in the erect position, except for short periods, and then with great discomfort.

Pain in the region of the sacrum, which seems to extend upwards, and is associated with a severe occipital headache, is very common. The pain in the back is constant, while the occipital headache is paroxysmal, and is usually exaggerated at the menstrual periods.

A very characteristic symptom of prolapsed ovaries which I have not observed with any other pelvic lesion, is a severe paroxysmal intermenstrual pain in the pelvis. This pain comes on from two to fourteen days before or after the periods, varying in different cases, but usually very constant in its relation in time to the period for each case.

The dysmenorrhea from which patients suffer is usually severe. In nulliparæ it frequently dates from the beginning of menstruation. In those who have borne children the pain usually dates from some time subsequent to the last labor, and usually from a date corresponding with the beginning of the pelvic pain and pain in the back. The pain, as a rule, begins before the flow, continues through the period, and for a day or more after the flow has ceased.

The nervous symptoms from which many of these patients suffer are of such a character that the patients are not infrequently classed as hysterical or neurasthenic. This is not correct, but the tendency of many of these patients to be easily excited, to cry without provocation; to laugh immoderately; to be easily irritated, and to be in a generally unstable mental condition, is very common. Occasionally one will go so far as to have convulsions, which are classed as hysterical convulsions. The convulsions have a tendency to recur at the menstrual period.

One patient complained of nausea whenever she was on her feet for a short time. Painful coition is one of the best known symptoms produced by prolapsed ovaries, and needs very little comment. It is of value, however, in only a limited number of cases.

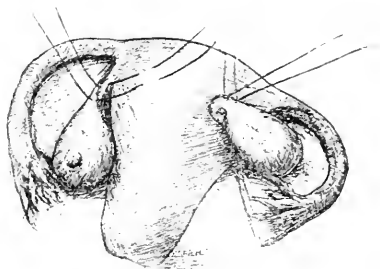
Painful defecation is also a common symptom. In some cases the pain comes on during the act of defecation, and in some the pain comes just after the bowel is emptied, and continues for some minutes.

It will be noted that many of these symptoms correspond very closely to those usually ascribed to retrodisplacements of the uterus. While at this time I do not feel justified in stating it dogmatically, I am reasonably satisfied that many patients with

retrodisplacements are suffering more from the associated prolapsed ovaries than from the uterine lesion.

Diagnosis: The diagnosis is usually made without difficulty. The prolapsed ovary can be felt quite easily in the cul-de-sac, directly behind the uterus, or can be caught between the fingers in the vagina and the pelvic wall. It can be recognized by its tenderness on slight pressure, by its shape, and by its tendency to slip away from the point of pressure.

Treatment: Before the operative era the treatment of prolapsed ovaries was the use of vaginal tampons and pessaries. The practically unanimous opinion was that very little at best, and usually nothing, was accomplished. Afterwards came the time of the removal of good, bad, and indifferent ovaries. As the



prolapsed ovary gave rise to much discomfort, and without reference as to whether it was diseased or not, it was removed along with the others.

Conservative surgery, which I understand to mean the removal of only hopelessly diseased organs, and the preservation of everything consistent with the restoration of the patient to health, makes the removal of prolapsed ovaries look like the bad surgery which it is.

Quite a number of the more recent text-books recommend the suspension of a prolapsed ovary by shortening the infundibulopelvic ligament, or by stitching the ovary to the peritoneum at the brim of the pelvis. But, apparently, very little attention has been paid to the subject. The only recent article in English that I have been able to find is one by Barrows, in the *Medical Record*, N. Y.,

1904, Vol. lxvi. He reports twelve cases in which he successfully treated the condition by making an opening in the broad ligament, bringing the prolapsed ovary through, and fastening it on the anterior surface of the ligament.

The operation that I have been doing for more than a year now is, I believe, simpler and more correct from an anatomical point than either of the above operations. It consists of shortening the elongated ovarian ligament by a couple of fine silk stitches. The first one takes a light but firm hold in the uterus, near the lower border of the ovarian ligament; it is then continued through a portion of the ligament and inserted firmly into the ligament near the ovary. The second stitch is placed in the same way, but near the upper border of the ligament. When these stitches are tied the ovary is brought close up to the uterus, but still retains a limited mobility independent of the uterus, and a complete mobility with the uterus.

As many prolapsed ovaries are associated with retrodisplacements, after the ovaries are fixed to the uterus, the operator can proceed to do the operation of choice for the correction of the displacement. I feel quite sure that the failure to properly suspend the ovaries is frequently the cause of the failure to relieve the symptoms when suspension of the uterus, to correct retrodisplacements, is done.

6 WEST PRESTON STREET.

ABNORMALITY IN AMNIOTIC SECRETION IN ITS RELATION TO FETAL MALFORMATION.*

BY

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(With eight illustrations.)

PROBABLY the main reason that teratology has possessed so little interest to the general practitioner is because of the absolute vagueness of the etiology of the subject, while the rarity of fetal malformations of the major grades is so great

* Read before the Valentine Mott Society at its January meeting, 1906.

that many physicians never meet with a case of this type in a lifetime of active practice.

It is true that heredity often plays an active part in the production of malformations of the lesser degree, such as hypospadias, harelip, partial absence of extremities, and the like; and it is well understood that these defects may be absent in one or more generations, only to reappear in the next; but it is self-evident that the major grades of monsters can scarcely, if ever, be of *direct* hereditary origin, for these unfortunate creatures seldom live for more than a few hours or days, and, if they do live, they seldom marry or procreate children. }



Fig. 1.—Case II. Oligohydramnios.

Examples of this hereditary influence in the production of fetal defects may be found in cases like that reported by Meckel¹ in which two children of a man by his first wife had harelip, while of four by his second wife, two had harelip and one cleft palate. In proof of the far-reaching influence of heredity it is added that two relatives of the father also had harelip. In this connection is also reported by Gade² the case of a woman who had given birth to three anencephalic monsters, but there surely could have been no direct hereditary taint in this instance,

for it cannot be supposed that any of the ancestors in the direct line were anencephalic!

The theory that antenatal, or so-called maternal, impressions can serve as an etiological factor in the production of monsters of *any* grade must be denied by every well-informed man, unless he maintains that this result may be due to hypnotic suggestion affecting the fetus *in utero*. If this stand is taken it must be admitted that the woman can, by suggestion, cause malformation of the infant at her breast as well as of her unborn child, for it has been abundantly proven by experiments recently conducted in Edinburgh and afterward reported and confirmed by Gage of Cornell, that the mammalian ovum is,



Fig. 2.—Case II. Oligohydramnios.

from the moment of its conception, an organism absolutely distinct from its parents, either mother or father.

It is freely movable, as it passes along the Fallopian tube and into the uterus, and the fact that it rests there while the process of development or incubation is going on does not make it materially different from the egg of the fowl, which may be carried from place to place, but which must rest quietly and for the proper length of time under the hen or in the wooden incubator if it is to be hatched.

In a word, the ovum of the mammal, instead of being a hard-shelled egg, like that of the fowl, which can be hatched under any suitable conditions of heat and moisture, is a soft-shelled

egg which can only be developed in that highly specialized incubator, the uterus,—which art will never be able to imitate. But if art cannot imitate the uterus as an incubator, it can at least substitute one uterus for another in animals of the same



Fig. 3.—Case IV. Polyhydramnios.

kind but of different species; for in the series of experiments to which reference has been made, the ova of one rabbit were successfully transplanted to the tube of another rabbit of distinctly different breed, where they took root, developed, and eventually were born into the world according to their kind.

This being the case, and it has been demonstrated beyond any question, it follows logically that, from a theoretical standpoint, the impregnated ovum of a woman could, but for the practical difficulties of technic in the way of such a radical step, be transplanted to the tube or uterus of another woman of different race without affecting the product of conception in the slightest degree. In other words, the ovum of a Chinese woman, impregnated by a Chinaman, could be transplanted to a negress, and the pregnancy would continue to term and result in the



Fig. 4.—Case IV. Polyhydramnios.

birth of a child possessing all the characteristics of its Chinese progenitors; the uterus of the negress having acted merely as the incubator which "hatched the egg," and as nothing more.

Once these facts are admitted, and no well-informed man can deny their accuracy, it becomes difficult to believe that the mammalian ovum, once it is impregnated, cannot be transplanted to, and successfully incubated in, the uterus of another mammal of distinctly different kind, but of the same placentation and duration of pregnancy. In other words, there is

no theoretical reason to be advanced why the impregnated ova of the cat cannot be transplanted successfully to the female dog and there developed and eventually brought forth as kittens. If this can be done, and the writer firmly believes that it can be, there is absolutely no reason to doubt that the impregnated human ovum could, with equal certainty, be transplanted to the tube or uterus of some other mammal of similar placentation and duration of pregnancy, where it would develop and, in due



Fig. 5.—Case V. Polyhydramnios.

time, come forth without losing any of the characteristics of its human parents nor taking on any of those of its incubator mother.

Nor need this frank assertion of the writer's belief strike terror to the soul of the sentimentalist, for if an infant can thrive on the milk of a cow or a goat without taking on any of the characteristics of these animals, so could the unborn

child, with equal safety, thrive on the nourishment supplied to it through the blood of a properly selected lower animal.*

It is true that this part of the subject is an entirely speculative one and that the transplantation of the human ovum to one of the lower animals may never be attempted, and certainly not until its feasibility has been demonstrated beyond all question of doubt and surgical technic has advanced to a



Fig. 6. Case VI. Oligohydramnios.

point that can assure absolute safety to both mother and ovum in the operation; but the writer is willing to put himself frankly

* In the discussion which followed the reading of this paper one of the speakers said that, while he admitted the fact that the infant could live on the milk of a lower animal, he doubted that it could exist upon the nourishment derived from the blood of a cow or a goat for he believed that the "*mixture*" (!) of the two bloods would prove fatal. There is, of course, no *mixture* of fetal and maternal blood in any case, but even if there were it could scarcely be feared, for the now abandoned operation of transfusion of the blood of a lower animal directly into the veins of a man was never accompanied by any other dangers than those due to clotting or infection.

on record in his belief that this operation can be successfully performed on lower animals of different kinds, and that it could be done to-day with the human ovum, were it not for the fact that it would be criminal to in any way endanger the life of the embryo.

With regard to the practical value of this radical and purely visionary procedure, it may be said that if, in the dim and distant future, surgical technic reaches a degree of perfection which will make the removal of the ovum from the mother a matter of assured safety to her and to the embryo, and if experiment proves, as I believe it will, that this ovum can be transplanted with safety and with satisfactory result, the



Fig. 7. Case VII. Polyhydramnios.

operation will be of inestimable benefit to patients suffering from certain types of cardiac disease who could not stand the strain of a full-term pregnancy, to certain cases of pelvic deformity in which the present treatment would rest between the early induction of abortion or Cesarean section at term, to cases of renal insufficiency or other cases showing marked symptoms of threatened eclampsia of such a character that the early termination of pregnancy would otherwise be indicated, and to that more or less mysterious class of women who habitually abort from undiscoverable cause.

Returning once more to the often alleged influence of so-called maternal impressions as a factor in the causation of fetal deformity, two facts must be kept constantly in mind. In the first place, if impressions of this sort can have any effect whatever on the unborn child they must occur very early indeed in pregnancy, for it is well known that the fetus, even as early as the third month, is almost perfectly developed to all outward



Fig. 8. Case VII. Polyhydramnios.

appearance, and any malformation of the major degree must, of necessity, mean an undoing of what has already been done before the deformity can be produced. Nevertheless, I have had a case cited to me as an absolute proof of the effect of antenatal impression, in which a woman *six months* pregnant saw a cat disemboweled and afterward gave birth to a child with a

thoraco-abdominal cleavage and protrusion of viscera, such as is shown in Fig.2. If it is claimed that this was the result of the profound mental shock which the woman sustained it must, perforce, be admitted that the fetus was normal at the time the shock occurred, and everyone knows that a normal six-months' fetus presents no fissure of the thoracic or abdominal wall. Hence it must be maintained that the effect of this shock to the mother was sufficient to cause the bursting open of the fetal thorax and abdomen, the extrusion of the viscera, and the subsequent healing of the wound around the edges! The gentleman who reported the case to me said that he had nothing to say in reply to these statements, but that he firmly believed the case to have been due to the effect of the "maternal impression," and merely reported the facts as he found them. It will be found by those who take the trouble to investigate such cases that the vast majority of them are as improbable as the one narrated, and it is hardly to be believed that any really scientific man will attach any importance whatever to such reports. In the next place it must not be forgotten that the fully developed fetus is, in point of fact, nearly two feet away from the mother, for, as it floats freely in the amniotic sac, its only connection with the maternal organism is through the umbilical cord, which contains no vestige of nerve tissue in its composition and averages twenty inches in length. Moreover, it is thoroughly well understood that there is absolutely no interchange of blood between mother and fetus, the transference of oxygen and nutrition on the one hand, and of carbon dioxide and waste material on the other, being accomplished entirely by osmosis.

In short, we cannot account for the major grades of fetal deformity on the ground of direct heredity for, in such cases, there can have been no forebears; we cannot account for them on the theory of antenatal impressions, for we are forced to admit that the ovum is so distinct from its mother that no such impression could possibly affect it; and we can merely surmise that a severe mechanical injury to the mother during pregnancy might so bruise the fetus that deformity would result, but we can never foretell the outcome in any given case, and it is hard to believe that any injury of sufficient violence to maim or deform the fetus would not, with equal certainty, cause immediate miscarriage.

In a word, we know practically, if not absolutely, nothing about the etiology of these cases, and it may properly be asked, "To what end is the value of investigation along these lines if the whole subject is a matter of such speculation that we can neither explain the formation of monstrosities nor prevent their occurrence?"

The answer to this question is plain and to the point. While it is true that, in the light of modern knowledge at least, we can neither explain satisfactorily nor in any way prevent the development of fetal malformations we can, in the majority of cases, at any rate, *foretell* the phenomenon with considerable accuracy, and so save the unfortunate parents much mental distress by preparing them, as it were, for the disappointment in store for them.

By this I do not mean that any practical value is to be attached to vague references to hereditary taints which *may* be reproduced in the forthcoming child; to absurd allusions to the probable effect of some mythical "maternal impression;" or to doubtful and wholly unnecessary suggestions that physical injury during pregnancy may have resulted disastrously to the fetus.

The prognostic points which I shall advance have definite prophetic value, as I have been able to demonstrate in five out of seven cases, the five in question being the last of the series. In the first two instances I could have foretold the condition with equal certainty had I, at that time, given special attention to the subject.

It is well understood that marked variation in the amount of amniotic secretion is usually if not invariably, associated with fetal malformation of some form or other, although sufficient prominence is not given to this subject in the text books and its practical value as a factor in prognosis is not generally appreciated by physicians. I can safely say that I have never seen a case of marked fetal deformity which was not associated with great abnormality in the amount of liquor amnii present, and, as I have said, I have made use of this observation with such success that in five cases out of seven my prognosis has been verified, while, in the remaining two cases, no comment was made, but the conditions were the same.

Just what constitutes abnormality in the secretion of amniotic fluid is a matter of some doubt, but, while the amount varies

considerably at different periods of gestation (being from four to seven pints at the middle of the period), the average quantity at the end of pregnancy is put by Fehling³ at three pints.

Marked variations from this amount give us the two diametrically opposite conditions known as *oligohydramnios*, in which the quantity of fluid may be but a few ounces or even entirely unappreciable, and *polyhydramnios*, in which the secretion increases, either suddenly or, more commonly, gradually, until it may reach the enormous quantity of five or six gallons or more.⁴

With the chemical and physical properties of liquor amnii and with its source of origin, we have nothing to do in a paper which is designed to be purely clinical in character, but it is of interest to note that, in most cases of *oligohydramnios* there is, as shown in Figs. 1 and 2, a marked distention of the bladder, due to retention of urine, and to remember that the necropsy in this case showed complete obliteration of one kidney and marked disease of the other; while the urethra was entirely absent. As renal secretion takes place from about the fourth month of gestation, and as it is well established that the fetus, during the last month of pregnancy at least, swallows a considerable amount of amniotic fluid, it is fair to assume that a certain proportion of this substance is no more than fetal urine, and that if the kidneys or bladder cease to functionate the infant may swallow what remains from other sources until all, or nearly all, is taken up.

Be this as it may, the fact remains that marked variation in the amount of amniotic fluid is almost invariably accompanied by fetal deformity, though, whether the malformation is due to the amniotic abnormality or *vice versa* I am not fully prepared to say.

The following brief report of seven cases will serve to emphasize the points in question:

CASE I.—Patient of the late Dr. George A. Spalding. Delivered by me for him during his absence from town about six years ago. Marked *polyhydramnios*. Pseudo-hermaphrodite. Lived three days. Autopsy refused.

CASE II.—Patient of my own. Absolute *oligohydramnios*. Achondroplasia. (See Figs. 1 and 2.)

In neither of these cases was any fetal abnormality prophesied, although the amniotic condition was marked in both instances.

CASE III.—Patient of the late Dr. Leonard F. Pitkin, seen

by me in consultation. *Polyhydramnios* marked, dilatation complete and amniotic sac apparent at vulva and filling vagina like a huge sausage. Prophesied deformed fetus before rupturing membranes. Amount of fluid at least three gallons. Child: clubbed feet; clubbed hands; webbed fingers and toes; imperforate anus; harelip and cleft palate. Lived six hours.

CASE IV.—Patient of my own. Marked *polyhydramnios*. Prophesied deformity with the result shown in Figs. 3 and 4.

CASE V.—New York Maternity Hospital. Author's service. Delivered by house surgeon, but diagnosis of *polyhydramnios* was made before delivery and result is shown in Fig. 5.

CASE VI.—Misericordia Hospital. Author's service. Patient never seen by me and delivered by the house surgeon. When the deformity (perobranchius and left perochirus, see Fig. 6) was reported to me I at once asked if there was any abnormality in the amount of the amniotic fluid and was told that none whatever had preceded, accompanied, or followed the delivery. *Oligohydramnios*.

CASE VII.—New York Maternity Hospital. Author's service. Was summoned to deliver the woman on house surgeon's diagnosis of shoulder presentation. Membranes ruptured before my arrival, and nearly four gallons of fluid were discharged. Because of this fact, and before examination, I prophesied some form of monstrosity. *Polyhydramnios*.

Result: *Anencephalus*, Figs. 7 and 8.

It is true that we have no way of foretelling the type of malformation that may result in these cases, but, in general, it seems that deformities of the trunk, such as lack of fusion and the like, occur in cases of *polyhydramnios*, while loss or shortening of the extremities are more common in *oligohydramnios*. These latter conditions, often called "intrauterine amputations" are usually attributed to the constriction due to alleged "amniotic bands," but I have never seen any of these bands, nor do I know of anyone who has, and it is far more probable that malformations of this class are caused by destructive atrophy of the parts, which, in turn, is due to the direct pressure of the uterine wall, unrelieved by the interposition of the normal amount of fluid.

That any form of monstrosity can be attributed to the effect of so-called maternal impression I believe to be absolutely absurd, if for no other reason than the clearly proven fact that

the impregnated ovum is, from the moment of its fertilization, an organism absolutely distinct from the mother, who merely serves as its incubator; and I am willing to put myself flatly on record as saying that I would no more fear the effect of an antenatal impression on the fetus *in utero* than I would expect a hen's egg, exposed for the proper incubative period in a mechanical incubator, to hatch out a chick with wooden legs!

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- 616 MADISON AVENUE.

INDUCED LABOR AS A CONSERVATIVE OPERATION IN CONTRACTED PELVES.*

BY

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THE problem which presents itself for solution to every obstetrician who accepts the responsibility of conducting a prospective mother through her confinement, is twofold; first, to preserve from harm or injury the life of the mother; second, to deliver her of a sound and healthy child.

Given these conditions, the successful termination of the labor must depend largely upon the skill, judgment, and care of the physician. In normal cases this is a comparatively simple matter; in complicated labors there is nothing requiring more ability as a diagnostician and skill as an operator.

The three factors which constitute the base of all labors are:

First, the expulsive power of the woman; second, the shape, size, and general character of the birth canal; third, the size of the child.

As individuality is the keynote of all nature, it will be readily understood how the variation of these three factors makes each case of labor a study in itself, the main features being the same, but with an infinite variety of detail.

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For the purposes of this paper, all labors may be divided into three general classes. Cases in which the natural powers are sufficient; cases in which forceps or version are needed to supplement the natural powers; and cases in which some one of the cutting operations on mother or child is required, or in which premature labor is induced to avoid the same. With the first and second divisions of this classification, we need not concern ourselves, my purpose being to discuss the conditions and treatment of the cases included in the last division.

Enumerating the usual methods of treatment in the order in which they are most frequently attempted, we may say that forceps, version, Cesarean section, symphyseotomy, and craniotomy comprise the list of available operations from which we must choose the one most applicable in a given case. The list is small and leaves little room for choice. Forceps and version are the methods most frequently selected by the average practitioner, his ability to apply forceps and do version being the sheet anchor of treatment in all difficult labors. The results are varied, success attending such treatment in the lesser forms of pelvic deformity and disaster following in others when greater skill and better judgment would have dictated a different plan of action. To-day we do not discuss symphyseotomy as we did a decade ago, for this operation, having been tried, has been laid aside as not beneficial. There remain two available operations, Cesarean section and craniotomy. Of these the latter should rarely be performed, excepting in the case of a dead child. Cesarean section, therefore, is our method of procedure. Before the days of Säger, the mortality was very high. To-day, following the most advanced ideas, and with the best surroundings, the mortality is conservatively estimated at 10 per cent. The figures of many operators show a much smaller mortality. In eleven Cesarean sections performed at the Johns Hopkins Hospital, one case was lost. Zweifel reports 76 cases and one death, and Reynolds 23 cases and one death. The figures for Columbia Hospital in Washington, are as follows: In 1903, out of a total of 444 patients during the year, there were five Cesarean sections and no deaths; basiotripsy and cephalotripsy were each performed once. In 1904 there was one Cesarean section; recovered. In 1905 one Cesarean section, which died, and three cases of vaginal Cesarean section, all of which recovered. A study of Cesarean

section as performed in hospitals throughout the country at the present day would show similar results. To the dweller in cities where the best surgical skill is at command with modern hospitals and nursing Cesarean section may be set down as a safe, sound, and legitimate obstetrical operation. There is, however, another side to the picture, and from the standpoint of the great majority of women, one which is of vital importance. The best surgical skill, modern hospitals and professional nursing, all of which are necessary for good results, are not within the reach of most women. To them Cesarean section means a last desperate chance. As Williams says (page 408, in his work on obstetrics), discussing the operation in unfavorable surroundings, "It should be remembered that when performed by inexperienced operators upon patients in a poor condition, and amid unhygienic surroundings, the results will be most disastrous."

It would appear, then, that in those cases in which the natural powers are insufficient, owing to the disproportion between the size of the child or "passenger" and the birth canal or "passage," there remains but one course of action open to the obstetrician when it is desired to deliver a living child; that the successful performance of this operation is of necessity limited to a small percentage of child-bearing women; that to the large majority of women a contracted pelvis (beyond the lesser forms) means the death of the child during labor, and more or less injury to the mother herself.

Accepting as true the facts which I have stated, you will agree with me that there remains but one solution of the difficulty. This is the induction of labor at such period of viability as will give the child the best chance of living. A study of premature labor as possible, with our knowledge to-day of obstetrical operations, combined with modern efforts toward preserving the life of the premature infant, will convince you that the subject is one well worthy of effort. While comparatively few physicians possess the requisite skill, experience and opportunity for performing a Cesarean section there are few to-day who cannot induce labor in a thoroughly aseptic manner, incurring the least possible risk to the mother. The same may be said of the necessary care of the premature infant. Any physician of intelligence can instruct a nurse in all that pertains to premature infant care and feeding.

Whether in the country or city the result should be the same.

The induction of labor in cases of pelvic contraction, when the object sought is the delivery of a living child, involves:

First, a knowledge of the period of gestation; second, a knowledge as complete as possible of the size, shape, and character of the pelvis; third, a knowledge of the size of the fetal head, and especially its size relative to that of the pelvic brim.

As the direct object of inducing labor is to enable a woman to give birth to a living child, it will be seen how important it is to be able to compute with exactness the period of gestation. Each day *in utero* which is given the fetus adds much to its growth and development, and helps to fit it for its premature existence. The importance therefore of determining the period of gestation cannot be overestimated. Accepting 280 days as the normal limit of pregnancy, 220 days has been set as the earliest possible time from which a child can survive.

In calculating this important date we are obliged to bring to our aid all the means at our disposal. The old rule, in universal use, of counting back three months from the date of the last menstruation, and adding thereto seven days, is probably the best means of determining the date of expected delivery. Quickening, when felt, should not be neglected. Important information can oftentimes be gained by the examination of the abdomen, the height of the uterus at various periods of pregnancy being ascertained, especially the relation of the fundus of the uterus to the umbilicus. Here, however, the fact must not be overlooked that in deformed pelvis there is a tendency toward a condition of pendulous abdomen, and likewise a height of the fundus greater than usual for the same period of gestation in a normal pelvis. Yet, as premature labor is never induced in cases of contracted pelvis until the last possible moment, the importance of the exact period of maximum gestation is lessened in the conditions under consideration, our efforts being directed to saving a child which is doomed if allowed to go to term. So long as we can be sure of the viability of the fetus we are warranted in inducing labor, whenever we are convinced that further delay would be dangerous.

To enable the obstetrician to ascertain the shape, size, and the character of the pelvis, there are at his disposal various pelvimeters, all of which are valuable within certain limits.

There is no pelvimeter at present in use, however, so far as my knowledge extends, which can accurately measure all the diameters of the pelvis as we would like in a case of contemplated induced labor. The best pelvimeter is the hand. I believe that by careful and thorough examinations of the pelvis by manual exploration, all the information needed in these cases can be acquired. As such an examination is apt to be painful to a nervous woman, an anesthetic is frequently needed. The mode of procedure just described is necessary in ascertaining the size of the child's head. The development of abdominal palpation as a means of obstetrical diagnosis has contributed very materially to our resources in determining the size of the fetal head. The head or presenting part must engage in the brim of the pelvis. Therefore, we are obliged to watch this constantly-enlarging head, and by pushing it down into the brim learn the relation which the one bears to the other. This must be done regularly and at frequent intervals. The rule is, that so soon as there is any difficulty experienced in forcing the head down into the cavity no time is to be lost in inducing labor. As in the case of pelvic exploration it may be necessary to use an anesthetic for purposes of accurate examination. I believe that in these cases little reliance is to be placed on figures, for I have always found that obstetrics practised by rule is bad in its results. There are, however, certain measurements which are of interest in this connection, and which may, with propriety, be incorporated in an article of this character. Tarnier, Budin and Stolz determined, by much labor, that the size of the biparietal diameter of the head (the diameter of most importance) was as follows:

At term.	3.75 inches
8½ months.....	3.4 “
8 “	3.2 “
7½ “	2.96 “
7 “	2.75 “

The fetal head may be compressed without injury 0.4 inches. If the conjugate is 3½ inches, then labor should be induced between 8¼ to 8½ months. Primiparæ (children usually being smaller) can wait until a week before term. When the con-

jugate is 3.35 inches, induce labor at from eight to eight and one-half months; if the conjugate is 3.12 inches, labor is to be induced between eight and eight and one-quarter months; if conjugate is 2.95 inches, induce labor at seven and one-half or eight months; when conjugate is 2.75 inches, seven months and three weeks; $2\frac{1}{2}$ to 2.36 inches at seven months. Below 2.36 inches conjugate, the indication for premature labor does not exist. These rules are for flat or generally contracted pelves.

Among American authors of note, Hirst seems to be most satisfactory in his experiences in induced labor. So sensible are his views that I quote them here, somewhat at length. On page 480 of his recent textbook on obstetrics, he says:

"There is nothing in medicine requiring more experience and good judgment than the management of labor obstructed by a contracted pelvis. It is extremely difficult to formulate hard-and-fast rules for the guidance of the inexperienced, when so many factors must be taken into account. * * * Due attention must be paid to the history of past labors, size of the child, its development and compressibility of the head, the age of the woman, the build of both parents, and the probable strength of the expulsive forces, greatest in primiparæ and less in successive labors. If the conjugate measures as low as 9.5 cm., it is a safe plan to induce labor four weeks before the expected termination of pregnancy. This course entails no additional risk on the child if its parents are in a position to afford the best care, and nursing it is the safest plan for the mother, the induction of labor done properly having no maternal mortality. It is true that many women with a conjugate of 9.5 cm. can deliver themselves without difficulty at term. Spontaneous delivery, with a measurement as low as 8 cm., has been recorded. But the majority of women with a conjugate of 9.5 cm. will experience abnormal delay and difficulty in labor, with added risk to themselves and their children; and in a certain number of cases a conjugate of 9.5 cm. proves an insuperable obstruction to labor, and is the cause of ruptured uterus or death from exhaustion in the mother, or of injury to the child's brain. For these reasons then the rule to induce labor when the conjugate is at or below 9.5 cm. is a safe one."

The object of this paper being, mainly, the advocacy of induced labor as a conservative and proper operation in those

cases in which the mother cannot secure the proper performance of the Cesarean section at term, it will not be necessary to go into details of the various recognized operations for this purpose. The development of the essentials of asepsis being thoroughly understood to-day by all physicians the possibility or probability of sepsis is reduced to a minimum. The great objection which existed against this operation in pre-aseptic days is thus removed. So far as my own observation extends, the best method is that in which a bougie is introduced into the uterus between the bag of waters and the uterine wall. This procedure dates from 1827, when it was first described by Riecke. Later, in 1836, Hamilton modified the operation by inserting the index finger in the same way. I have never known the bougie to fail, although it may require replacing from time to time. Contrary to the general opinion, labor is not set up as quickly as supposed. Repeated efforts are required to inaugurate expulsive pains. If not of sufficient force to accomplish the desired end in a reasonable length of time, forceps may be applied as soon as sufficient dilatation of the os permits and the child delivered by that means.

The condition of the premature infant and its chance for survival must, of course, depend largely upon its development at birth, and the care and attention which it subsequently receives. Fortunately, modern medicine recognizes the fact that these waifs of humanity, if properly nursed and tended, have a fighting chance of life. Thanks to the incubator and gavage, much may be done for them, and a study of the results achieved warrants the persistent effort to do more. With us the care of premature infants has the interest of experimentation and novelty. In France, the matter is of far greater importance. French statesmen and physicians, recognizing the fact that the French birth rate is so low as to threaten the extinction of the race, have made the study of everything which pertains to the rearing of premature infants a national one. In many of the large cities there have been established hospitals for this purpose alone. Such institutions are to be seen in Lyons, Marseilles and Paris. The encouraging results show what can be done when the right effort is made. The Paris Maternity reports 30 per cent. of the six months infants saved. Compilations of statistics from various authorities show a saving of 63.6 at seven months, and 85.7 at eight months. The figures

taken from the American Text-Book of Obstetrics are as follows:

6 months.....	22 per cent.
7 " 	38 " "
8 " 	89 " "
8½ " 	95 " "

Charles, in a series of 932 births, reports: 10 per cent. saved at six months, 20 per cent. at six months and a half, 40 per cent. at seven months, and 75 per cent. at seven and a half months.

Once these infants are safely delivered, the chances of their survival must depend largely on their development, and then the care bestowed upon them. Winckel says 10 per cent. of all the children born in the world died before the eleventh day, 6 per cent. during labor, and 3.3 per cent. from injuries received during birth. Eröss, from a study of one million, five hundred thousand deliveries, in sixteen of the largest cities in Europe, found a mortality of 10 per cent. at the end of four weeks, of which 54 per cent. was due to congenital debility—one still birth to every twenty-eight and a half deliveries. Clark, of Cleveland, reports, in 1896, births, 8,927; deaths, under one month, 888 or 9.9 per cent. These figures represent fetal mortality from all causes in the first month after birth. As, however, induced labor, at the time of the compilation of these figures, was not extensively followed, the deaths there set down must be largely due to causes other than premature birth. Injuries received during birth, pressure from too long labors or from the use of instruments or versions in cases of contracted pelvis, would undoubtedly count for much. Herein I think this appalling infantile mortality is accounted for. Rather than wait until full term and have a Cesarean section done in cases where that operation can be secured, or failing a Cesarean at full term, resorting to the induction of labor at such time as the case will warrant, the treatment followed generally through ignorance and indifference combined, is to take the chances of spontaneous delivery at term. If delivery does occur, the labor is unduly prolonged, with harm to the mother and death of the child. The child, even if surviving, is in many instances so injured as to be permanently crippled, mentally or physically. Should spontaneous de-

livery not occur, forceps and version are successively applied with the same results. As a finale craniotomy closes the scene.

In considering a line of treatment for so important a matter as labor occurring in a woman, with a greater or less degree of pelvic contraction, we must not limit our efforts to laying down a course of procedure applicable to women in one class of life only. To pass safely through confinement by giving birth to a living child, is a matter of as much vital importance to the woman living in the country or small town or village as it is to her sister in the city within reach of surgeons, hospitals, and nurses. All the resources of obstetric art and modern science are at the service of the latter, but the former must content herself with that which can be done easily and simply. To her, Cesarean section is out of the question in a great majority of cases. Herein lies the value of induced labor. By the observance of the rules of asepsis, and by careful examination of the patient at frequent intervals, all that is necessary in such a procedure may be successfully carried out by any physician of intelligence. The results will show a minimum of mortality for the mother, and for her child a better chance of life than labor at full term or any one of the emergency operations resorted to when there is a failure of the natural powers.

THE SYSTEMATIC WEIGHING OF INFANTS A GUIDE TO NORMAL GROWTH.*

BY

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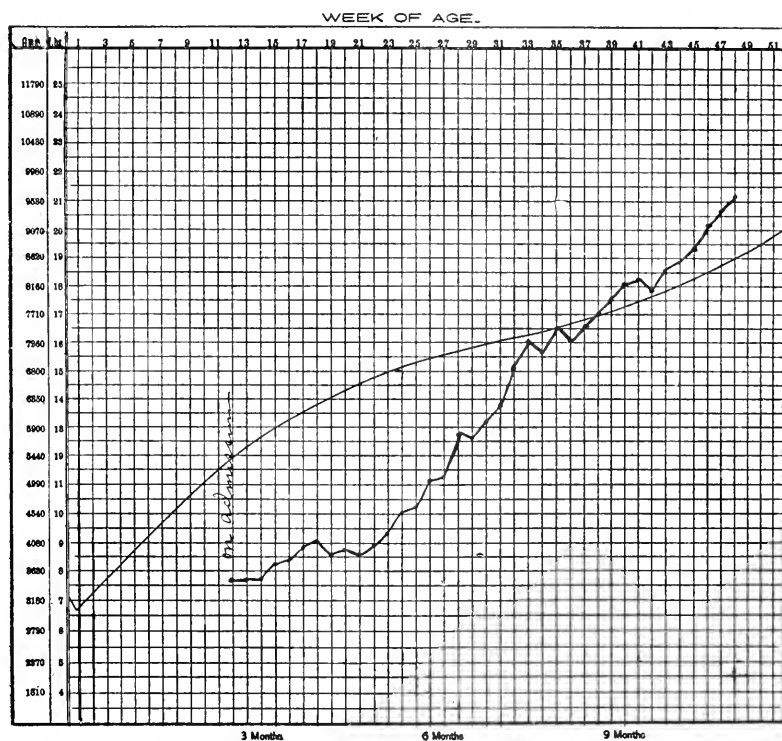
(With eight charts.)

NUMEROUS guides have been laid down for determining the normal infant during its first year, such as growth, weight, irruption of teeth, condition of the fontanelles, etc. By such means one should be able to differentiate the normal from the abnormal types. Growth and weight are interdependent factors in the physical development of the infant. If the infant add so many inches to its length during the first year to conform to the normal standard, it must also proportionately add to its weight. Growth and weight are dependent upon nutrition,

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hence, if the latter is faulty, it is indicated by impeded growth and stationary or descending weight.

While it is important to observe the gradual increase in length, it is more important to note the daily or weekly gain or loss in weight, as by this means the nutrition of the infant is best determined. This can be accomplished by systematically and accurately weighing the infants at stated intervals.



double its weight in six months, while another would start at nine pounds and double its weight in six months. In both instances the relative gain would indicate normal growth. On the other hand, the failure to double the initial weight in the first six months may, as a rule, be considered as evidence of lack of sufficient growth, although such an infant might steadily

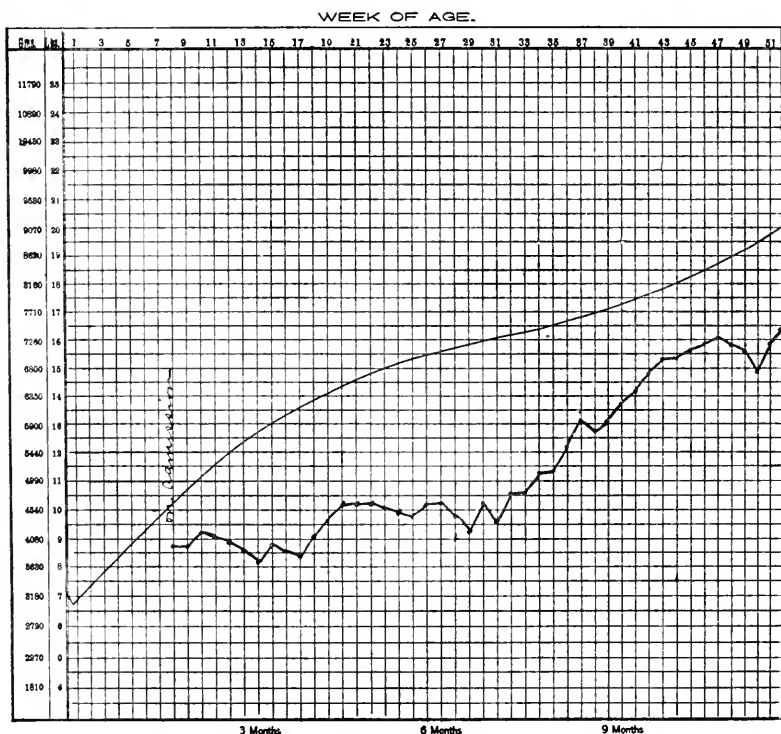


CHART II.—A. F., shows a relative gain with slight transitory losses. He started at $1\frac{1}{2}$ pounds below the average and, in spite of the actual gain, he is 4 pounds below the average at the end of the year.

gain in weight. While the first two instances conform to the normal type and are to be taken as healthy growing infants, the last must not always be regarded as either unhealthy or underdeveloped. A small stature is not incompatible with health and growth. Progressive loss in weight may be taken as evidence of faulty nutrition, but acute and chronic diseases which usually interrupt, if not permanently impede weight and

growth, must not be excluded as factors. Thus the infant may take food of proper quality and quantity, may digest and, apparently, assimilate it, but will nevertheless steadily lose weight. This loss may safely be attributed to some unrecognized condition, which prevents the appropriation of the proper nutriment.

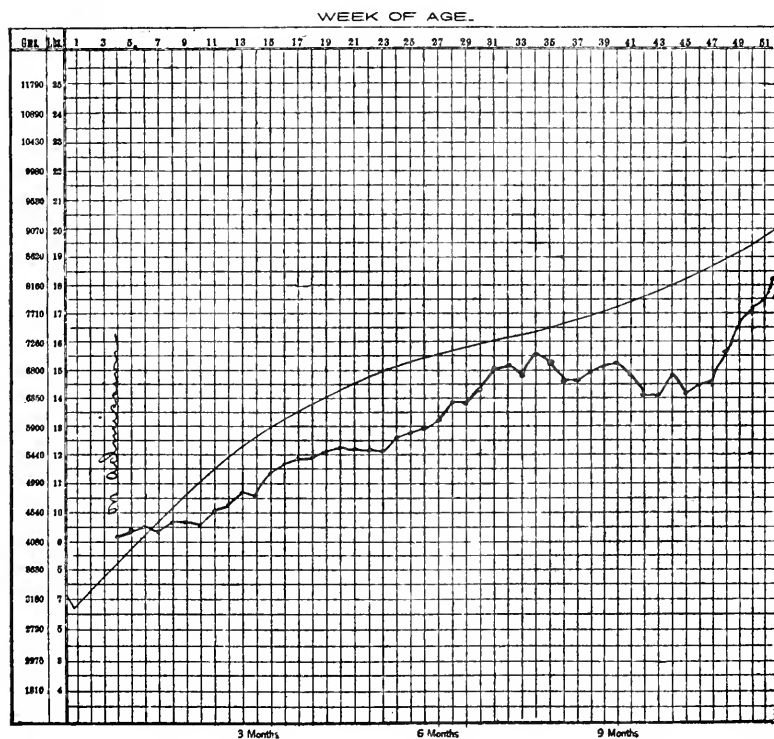


CHART III.—I. M., starts above the average, but soon falls below it, and although there is a steady gain, the average line is never reached again.

According to Holt, the average weight of 1,158 infants at birth was 7.35 pounds. He has constructed a weight chart based upon 10,000 observations, upon which is a curved line, which represents the average weight of a healthy infant during every week throughout the first year. It is the simplest, neatest, most convenient and most accurate published chart, and should be used by mothers and physicians in recording an infant's weight.

It is quite important for accurate observation that a uniform method of weighing should be adopted and invariably practised, otherwise the deductions to be drawn from either gain or loss in weight cannot be depended on. For instance, at one weighing the infant is just about to take his food and the following week he is weighed just after taking six ounces of food;

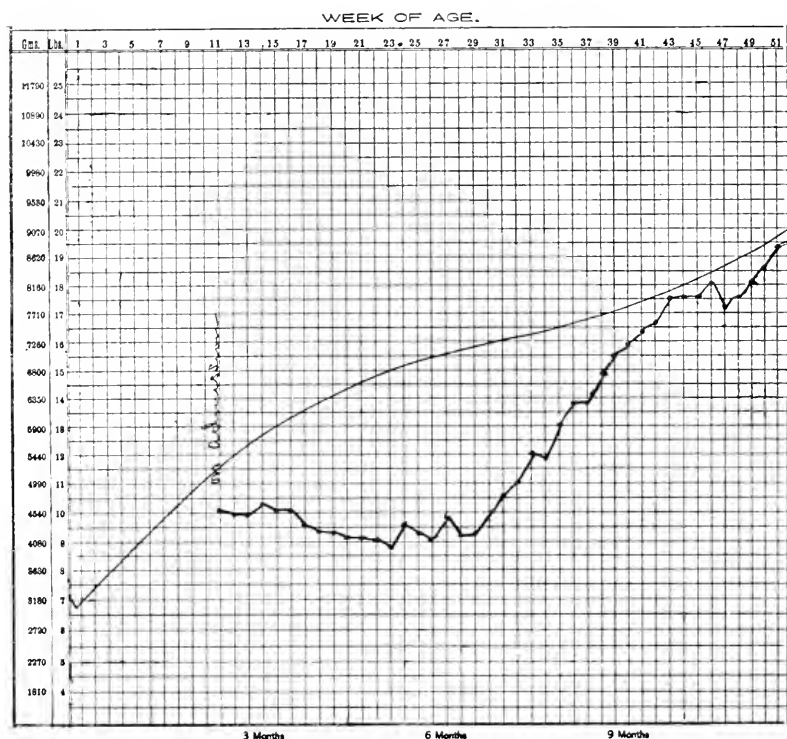


CHART IV.—B. M., shows nearly a continuous loss for two months, and then a sudden gain of 9 pounds in the last nineteen weeks of the year. She started at $1\frac{1}{2}$ pounds below the average and stopped 2 pounds below.

the deductions are inaccurate because the conditions were not identical. It is better to weigh the infant at the same hour each time, preferably in the morning just after the bath and just before a feeding. Much confusion often arises from those methods of weighing which require deductions of weight for baskets, clothing, etc. It is best to have the infant naked and use a scales that can be so adjusted as to avoid weight deduc-

tions. I recommend a dial scales, with an adjustable screw. The basket and blanket are placed upon this and the indicator set at zero. The infant is now wrapped in the blanket and placed in the basket and, when motionless, the exact weight is indicated on the dial. Care must be taken to read the indicator when the infant is motionless, for a vigorous, wriggling or kicking youngster will add a pound or two to his real weight.

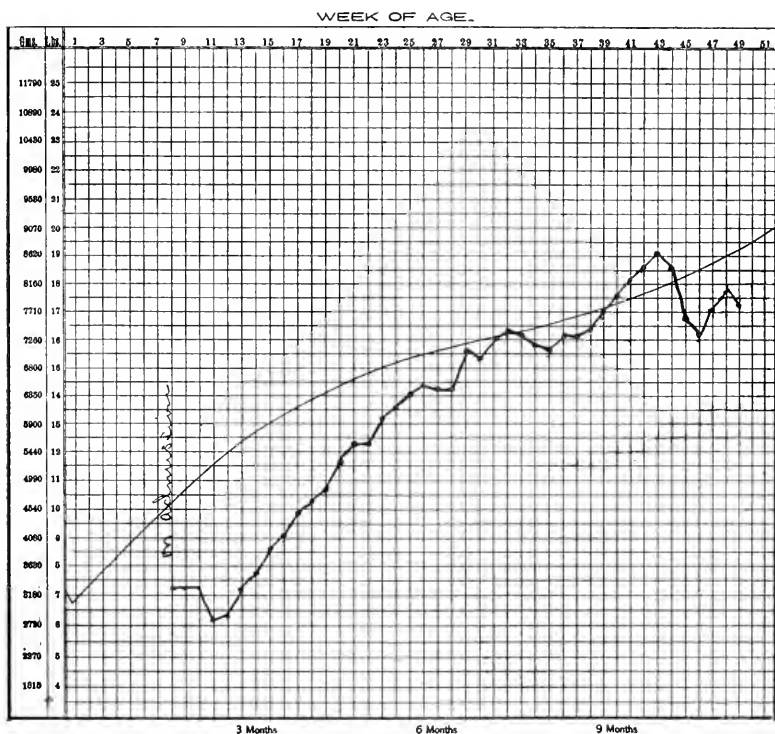


CHART V.—M. R., stands still for two weeks, loses 1 pound the next week and then gradually reaches 1 pound above the average at the fourth week. She now has measles and loses $2\frac{1}{2}$ pounds, putting her nearly 2 pounds below the average at the forty-sixth week.

During the first week of life, the infant should be weighed daily, and thereafter weekly. In delicate infants daily weighing is often advisable to determine whether there is gain or loss from day to day, as well as to determine also the nutritive value of the food that is being given.

During the first week there is usually an initial loss of from eight to sixteen ounces in weight of the new-born, which is due to the discharge of urine and the meconium and the consumption of stored material. The output of waste is so much greater than the intake of nourishment that loss of weight ensues. The amount of nutriment contained in the mother's milk during the

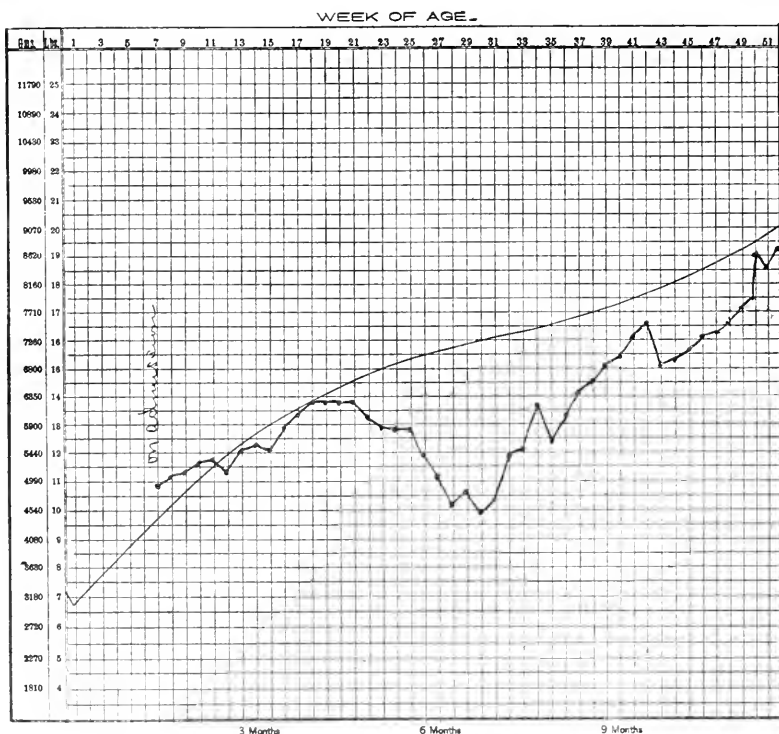


CHART VI.—M. L., starts above, gains, then loses and falls one-half pound below. In seven weeks he gains that half pound and reaches the line, but again loses, and in twelve weeks is 6 pounds below. He now gains, with a few interruptions, until the fiftieth week, when measles causes a drop of a half pound, which is regained the next week, making him ten ounces below at the end of the year.

first few days is not sufficient under any circumstances to prevent the initial loss of weight in her infant, hence it is accepted as a part of the infantile development that such loss must be sustained—a physiological rather than a pathological process. We now appreciate the importance of preventing this initial loss and feed the infant until the establishment of the equilibrium

in the mother's milk. We no longer tolerate the time-honored custom of allowing an infant to scream for food for a week or more until the mammary glands demonstrate their ability or inability to secrete sufficient nutriment for it. Very many infants lose so much weight in this time that they cannot regain

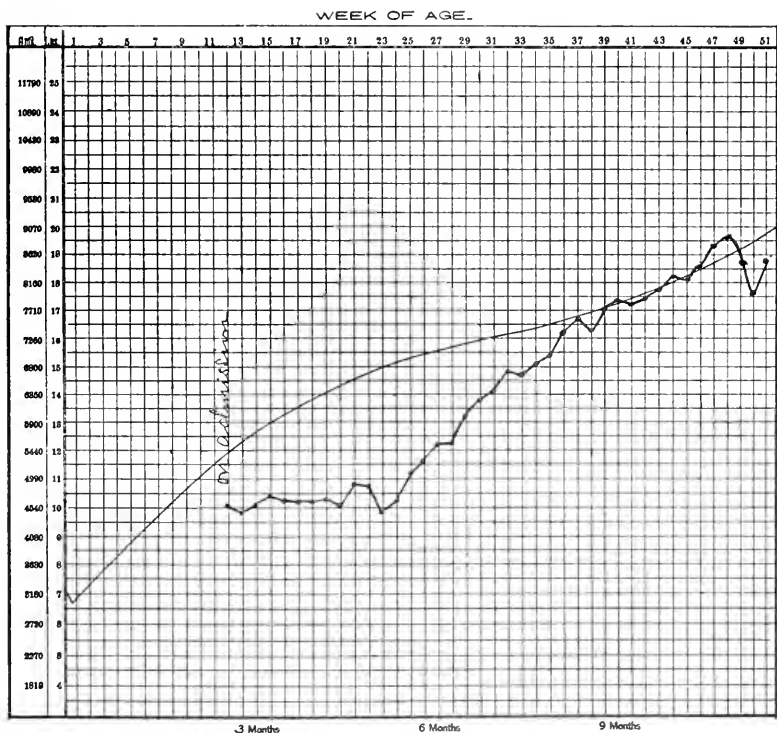


CHART VII.—S. M., stood still for a while and then gained rapidly, passing the average at the thirty-eighth week. At the forty-seventh week she was a pound above, when measles caused a loss of nearly a pound, which put her below again.

it after the mother's glands become active, so they die, within a week or two, from inanition.

The weight of the nursing infant usually increases after the third day; if it does not there is something the matter with the mother or her infant. Either the mother is not supplying the right kind of food, or the infant is not appropriating it, if it be the right kind. Fever and loss of weight during the first few

days usually means inanition, and may be prevented by giving either supplemental or substitute food in some modification of cow's milk. Quite often the mistake is made of trying to whip up the mother's glands when they are unable to secrete proper food. Such temporizing is injurious to the infant. If, at the end of the first week, the mother cannot supply the proper nourishment, she will not be likely to do so in another week.

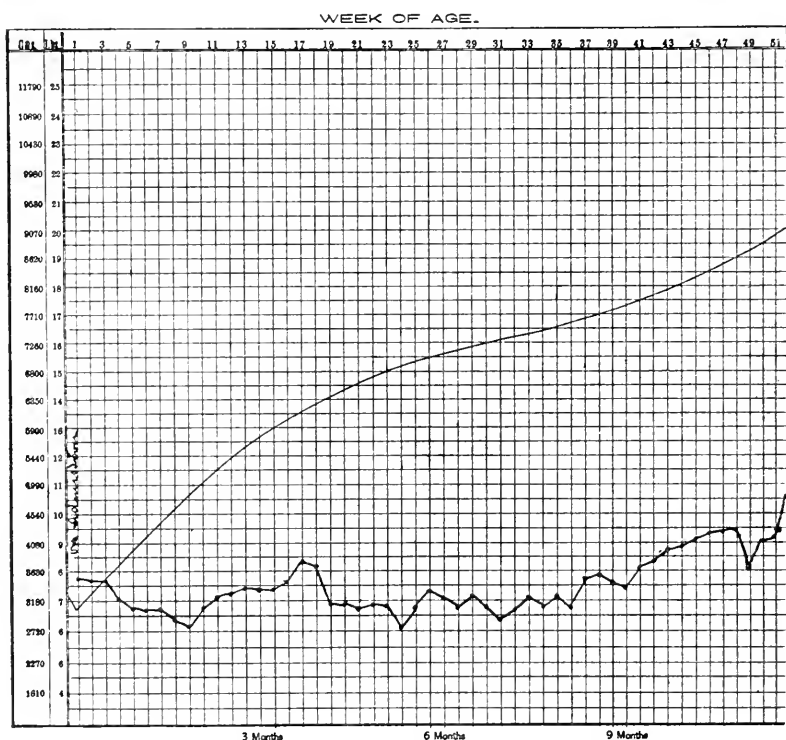


CHART VIII.—M. S., presents a type of bad nutrition. On admission she was ten ounces above, but soon fell below, and at the end of the year only weighs $2\frac{3}{4}$ pounds more than the initial weight.

Exceptional infants may neither gain nor lose for several weeks and yet seem well. The infant gains most rapidly during the first three months; from three to six months there is not so much gain; from six to nine months there is a gain of about one and a-half pounds, and from nine months to the end of the first year a gain of three pounds.

The healthy, well-fed infant will show a general conformity to the average weight, whether the initial weight is above or below it, and as long as this relation is maintained, we may assume that the nutriment is of the proper kind. If, however, the infant shows a weekly loss, and there is no acute or chronic ailment to account for it, we may conclude that the food is not sufficient for its nourishment, although there are evidences in the stool of normal digestion. Loss of weight is just as likely to occur in the breast-fed infant as in one artificially fed, provided the food is not right. If the loss be due to some transitory condition, the infant will make up the weight in a week or two, while, if the food is insufficient, the weekly or daily loss will continue.

It may be set down as the rule that a healthy, well-fed baby will gain at least four ounces every week, and a few may gain a pound. If, in some instances, the gain is only an ounce or two, it would be bad practice to let the infant take the same food more than two or three weeks. A change of diet is now surely indicated, whether the infant is nursed or bottle-fed. The mistake is often made of accepting the breast milk as the best food, when the infant is constantly losing in weight and giving other evidences of lack of nutrition. An instance of this kind came under observation recently. The mother was sure that she had an abundant supply of wholesome milk, because it "ran from her all the time," in spite of the fact that the baby seemed starved, did not sleep and cried "*with colic*" almost continuously. The infant was deprived of the breast milk for two days, being fed upon modified cow's milk. At the end of this time, the infant had made the first gain in several weeks, was satisfied with each feeding and sleep was natural. To the suggestion of feeding and nursing alternately, the mother remarked that she "had no milk"—not a surprise.

Such an instance as the following is familiar: An infant five or six months old is taking food suitable, both in quality and quantity, to its age. Every feeding is retained, there is neither regurgitation nor vomiting, the two or three daily stools are normal and sleep is natural, but there is a steady loss of weight. The food may be strengthened, but the loss continues. The trouble is not with the food, but with the child. Such conditions are usually found in the insidious onset of tubercular peritonitis.

Infants in private practice have greater weekly gains than institutional babies, although both are fed by the same formulas. The former get exercise in the open air and are handled more. This enables them to digest their food and they are eager for it. Hospital babies are not so thrifty, especially in foundling institutions, where there are difficulties from the start.

The only disadvantage in systematically weighing infants is that the mothers sometimes become greatly worried because the baby has not gained, or has lost an ounce or two since the previous weighing. Their anxiety may often be allayed by the assurance that some temporary cause is acting, especially when every other condition is satisfactory. The interpretation of weights often causes as much unhappiness to the new mother as the use of the clinical thermometer. In both instances one factor only in the infant's condition is considered, and that is emphasized. While the record of systematic weighing is useful, it must be intelligently interpreted to prove of value as a guide to normal growth of the infant.

The charts are introduced to show different types of growth, as well as the influence of acute disease in lowering the weight. The infants are now under my care in the Washington Hospital for Foundlings.

THE USE OF AN INTERCUTANEOUS STITCH IN PLASTIC OPERATIONS ON THE PERINEUM.

BY

BROOKE M. ANSPACH, M.D.,

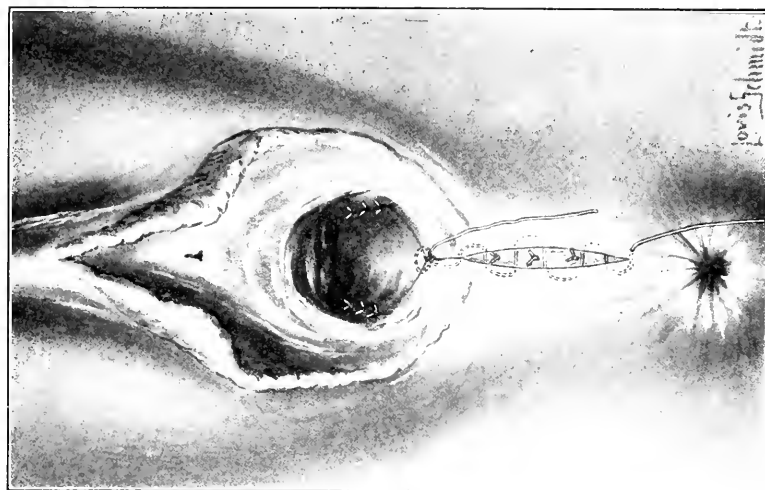
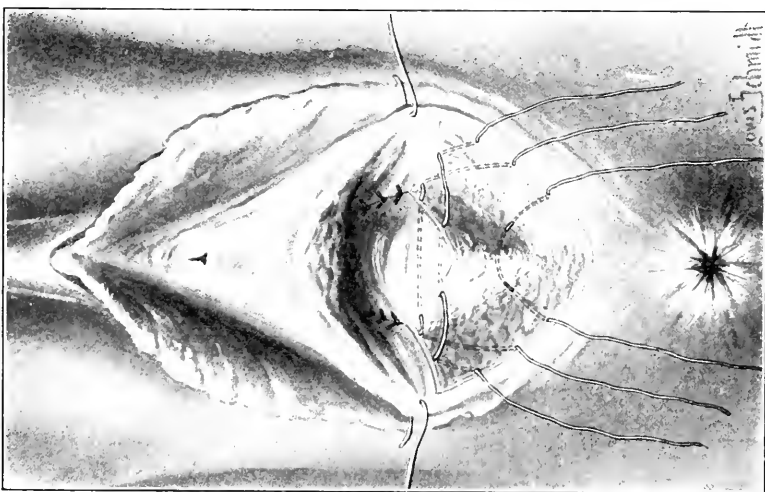
Gynecologist to the Philadelphia Hospital; Assistant Gynecologist University Hospital.

(With Plate.)

THE intercутaneous stitch had given such excellent results in celiotomy wounds that about eight months ago I began to use it in posterior colperraphy operations.

The plan adopted was to perform the operation (Hegar or Emmet) according to the customary technique up to the insertion of the external sutures, which are usually introduced from the skin surface of the perineal body.

By this new method, the external sutures are introduced and brought out just within the skin borders of the denudation. (See Fig. 1.) After these sutures are tied, the intercутaneous



ANSFACH—THE USE OF AN INTERCUTANEOUS STITCH IN PLASTIC OPERATIONS ON THE PERINEUM

Fig. 1.—Showing the introduction of the sutures within the skin border of the denudation (looking slightly downward).
Fig. 2.—The external buried sutures have been tied and the course of the intercutaneous stitch is indicated. The two ends of the suture are lightly tied together at the completion of the operation.

stitch is employed, running from above downward. (See Fig 2.) The advantages of an intercutaneous stitch are as follows:

The crown sutures are buried; catgut may be used because the sutures are well protected from infection by the neatly approximated skin.

Catgut sutures may be used throughout the operation, so that there are no sutures which require removal—a matter of considerable importance to many patients.

The pressure necroses and the pitting of tissue commonly observed when the usual external stitch is used are entirely avoided. Dr. Clark has adopted this method for his plastic work. It has been used in fifty cases in the University Hospital. The results have been uniformly good. For the first twenty-four hours the patient may complain slightly more of pain than is noticed after the ordinary plastic operation. The difference, however, is very little.

1928 CHESTNUT STREET.

TWO CASES OF INTESTINAL DIVERTICULA.*

BY

C. F. KIVLIN, M.D.,

Troy, N. Y.

(With three illustrations.)

CASE I.—L., aged 4 years. Patient of Dr. F. F. Stannard. Family history negative. Present history negative. Present trouble began at birth. About two weeks after birth the mother noticed a small protuberance at the umbilicus, which varied in size, and which she likened to a strawberry. It continually discharged a white fluid, and at times blood. The child was nervous and irritable, and seemed undersized for its age.

Examination.—Child fairly well nourished; heart and lungs normal. At the umbilicus was a round, red tumor, about one-half inch in diameter, looking very much like a cherry, at the summit. It presented an opening with lips slightly everted. Diagnosis: Meckel's diverticulum patent at umbilicus. Operation at the Troy Hospital April 26, 1905, consisted simply in making an incision around the umbilicus. When the peritoneal

* Read before the Medical Society of Troy and Vicinity, May, 1906.

incision was finished the diagnosis was confirmed. At this time I easily passed a probe through the diverticulum into the bowel without encountering any stricture. The diverticulum, about four inches in length, was attached to the ileum, opposite its mesentery, and about two feet from the head of the cecum. The diverticulum was removed by stripping off its peritoneal coat and ligation. The bowel was closed, the stump cauterized with pure carbolic acid, and covered with the cuff of peritoneum. The appendix, which did not seem diseased, was removed, and the abdomen

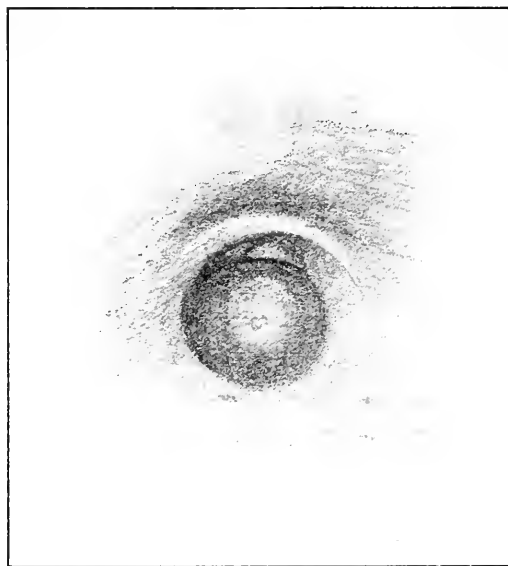


Fig. 1. Protrusion at Umbilicus. Case I.

closed. The patient made an uneventful recovery. Discharged from hospital fourteen days after operation.

CASE II.—Mrs. M., aged 62, married, native of Scotland. The first day I saw her she was semiconscious, pulse irregular and intermittent, with slightly atheromatous arteries. Fine crepitant râles were heard, and the breath sounds were tubular. Abdomen distended with gas, which could be seen to leave one portion of the bowel to balloon another. To the left of, and over the anterior wall of the stomach, could be felt a mass as large as a turkey's egg, which seemed to be a new growth in the anterior wall of the

stomach. On palpation of the abdomen the splashing of the intestinal contents could be plainly heard. Diagnosis before autopsy: Cancer of the stomach. The patient died on the second day. Autopsy showed the heart normal, lungs consolidated at base. Diagnosis: Senile pneumonia. The left kidney was firmly adherent to the anterior wall of the stomach, the kidney undergoing cystic degeneration. Right kidney displaced; otherwise normal. Bowels greatly distended with gas. Searching for the cause of the distention, I found a double row of hernial pouches



Fig. 2. Meckel's Diverticulum. Case I.

on the sigmoid, running well down onto the rectum, varying in length from the bowel to the summit of the hernial pouch from $\frac{1}{4}$ to $1\frac{1}{4}$ inches, and from $\frac{1}{16}$ to $\frac{1}{4}$ inch in diameter. The hernial pouches were made up of all the coats of the intestines, and they were opposite the mesentery, numbering twenty or more on each side in two distinct rows, opposite each other, and on the free portion of the bowel one row on each side of the middle line. Some of the diverticula contained feces, and others fecal concretions. Diagnosis: Acquired diverticula.

Intestinal diverticula are divided into two classes: Congenital and acquired. The former are known as Meckel's diverticula, possess true intestinal walls, and are caused by the patency of the omphalomesenteric duct; they are also known as "true" diverticula. The acquired, or false diverticula, are hernial pouches of

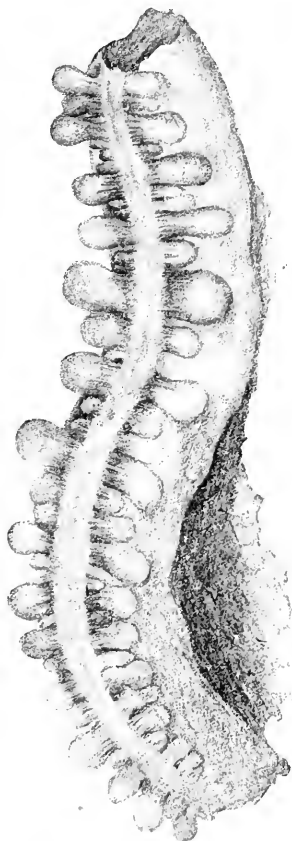


Fig. 3. Acquired Intestinal Diverticula. Case II.

the intestinal canal. They are frequently simple protrusions of the mucosa through the muscular coat of the intestines, but also sometimes possess a muscular wall. It would be much less confusing if the term diverticulum was abandoned for the acquired form.

Meckel's diverticulum owes its origin to the failure of the omphalomesenteric duct to become obliterated. Toward the end of the fourth week of embryonic life of the human fetus, the intestine and yolk-sac are in direct communication through the open abdominal wall. After the closure of the wall they are connected by the omphalomesenteric duct. Alongside of the duct are a corresponding artery and vein.

After the sixth week of embryonic life the vesicle, duct, and vessels wither and are represented by a cord. Should any disturbing influence interfere with the shrinkage, the entire duct may remain open to the umbilicus, or a portion may close and become the fibrous cord. Under ordinary circumstances the cord undergoes fatty degeneration and disappears.

The diverticulum is usually found attached to the lower portion of the ileum, that is, about three feet above the ileocecal valve; but it may arise at any point between the duodenum and the cecum. The diverticulum varies also in length.

The cord at the end of the diverticulum may lie free in the abdominal cavity, or it may be attached to the umbilicus, the abdominal wall, the mesentery, the ileum, or the ascending colon. The diverticulum, if there be no cord, may be attached to the omentum, the mesentery, or the ileum. This variation in the point of attachment is, according to Fitz, not caused by inflammatory adhesions, but is due to the persistence of certain omphalomesenteric vessels according to the seat and extent of the atrophy.

There are several varieties of the strangulation caused by diverticula or omphalomesenteric bands. The most frequent is that already mentioned, in which the bowel is caught under a band with mesenteric attachment. In the case of a long, loose terminal ligament, a coil or knot may be formed by which a loop of intestine may become snared. This may occur the more easily if the intestinal loop has a narrow mesentery.

Occlusion of the intestine by traction occurs when the ligament is attached to the abdominal wall, and becomes so stretched by meteorism that the lower part of the small intestine, especially when fastened down by a short mesentery, is drawn upon and bent at the origin of the diverticulum to such an extent that its lumen is obliterated (Leichtenstern).¹ Strangulation by Meckel's diverticulum occurs more frequently in men than in women, and most frequently between the ages of twenty and thirty years. It has also been observed at earlier ages. The portion of the

intestine strangulated is almost always the ileum. It leads to a fatal result in from four to six days.

Meckel's diverticulum is probably present in from 1 to 2 per cent. of all individuals. It is said by Halstead to be the cause of intestinal obstruction in 6 per cent. of all cases.²

Oliver C. Smith says that from its rarity in the human subject, abdominal crises due to Meckel's diverticulum can never be of frequent occurrence; but it is one of the conditions which the surgeon must bear in mind when making a diagnosis, and when searching in the abdominal cavity for the cause of the obstruction and of the peritonitis. No class of cases demonstrates more clearly the great importance of early laparotomy, for, whether we are dealing with an obstruction from a diverticulum or from a general peritonitis due to a perforation, we are dealing with an emergency, the existence of which, unrelieved, adds each hour to the gravity of the situation, and reduces steadily and surely the chances of recovery.³

In Porter's⁴ list of 184 cases, the mortality is 60 per cent. Of those patients operated on, the mortality is 50 per cent.; while in the cases in which diagnosis of strangulated hernia and appendicitis were made, and in which, therefore, the persons were operated on early, as in the rule of these conditions, the mortality is 10 per cent. He says: "Words might preach a more eloquent sermon against delay in surgical intervention, but not a more powerful one."

Symptoms: The symptoms are those of acute intestinal obstruction. According to Fitz,¹ in nearly one-half of the cases previous attacks of pain are recorded. The history of a discharge from the umbilicus, such as was recorded in one of the cases described, would suggest the presence of a diverticulum.

Barring this class of cases, I cannot conceive any possible way of determining this condition positively. In fact, in M. L. Potter's record of 184 cases, in only one case was a positive diagnosis made, and that was Oderfield's case reported by Halstead.⁵ Treatment of persistent Meckel's diverticulum may require anything from simple excision of the diverticulum to a complete resection of the bowel, treatment depending on the amount of destruction.

In conclusion I would urge, as there is an abundant positive proof of the dangerous rôle which this remnant plays, the removal

of it in the course of abdominal work, whether or not it is the source of trouble, unless the seriousness of the case or the patient's condition contraindicates the extra risk.

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2. *Annals of Surgery*, Vol. 35, p. 471.
3. *Annals of Surgery*, Vol. 40, p. 746.
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2235 FIFTH AVENUE.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of October 9, 1906.

The President, LEROY BROWN, M.D., in the Chair.

DR. CHARLES JEWETT presented the report of a case of

HEBOTOMY.

The patient was a woman of 22 years, fairly robust, and presenting no obvious signs of bony deformity. She gave a history of two term labors. The first, in 1902, resulted in stillbirth, after a very difficult forceps delivery. The second child, a year later, was extracted by podalic version and died in eighteen hours.

June 22 last I was requested to see her in her third confinement. She had been in labor forty-two hours. The head was arrested at the brim in L. O. A. position. Forceps had been tried to no purpose. Manual examination, under anesthesia, revealed no apparent pelvic deformity, but the head could not be brought into the pelvis with axis traction forceps by any safe amount of force, with the help of the Walcher posture. The woman was then sent to the hospital and delivered by hebotomy of a child weighing 10 pounds, 5½ ounces.

The pulse, before operation, was 118, and the patient was too long in labor and too much exhausted for Cesarean section. The temperature was 100. The left pubic bone was divided to the inner side of the pubic spine, with a Gigli saw, in a nearly vertical direction. Attempt was made to pass the carrier subcutaneously, but the overhanging abdomen made this so difficult that the attempt was abandoned and the bone laid

bare by a free incision. A heavy silk thread was carried down behind the bone with a stout curved needle, and the Gigli saw drawn into place. The carrier was made to hug the bone, a finger within the vagina serving as a guide. Yet, after the sawing, profuse hemorrhage occurred from the veins below the lower margin of the pubis anteriorly, and especially from the crus clitoridis. The bleeding was readily controlled by pressure and the child easily extracted with forceps. A short tear was found in the anterior vaginal wall opening into the incision. A small area of the bladder was exposed through the operation wound. The vaginal laceration would probably have been prevented had not too wide separation of the bones been permitted, owing to inexperience of the assistants. The bones were brought together, the vaginal tear sutured and the wound closed, a silkworm gut drain being left behind the bone. The drain was removed in twenty-four hours. The wound healed per primam almost throughout, a very small fistula persisting at the seat of the drain for several days. The maximum temperature, after operation, was 101° , and this for but one day. There was no complication, except thrombosis of the femoral veins in both lower extremities.

Retention was maintained, in part, by adhesive straps and a firm spica bandage. The patient was placed on a hospital stretcher, the poles of which were lashed to the top rails of an iron bedstead. A trap door was provided for the dejecta. The use of the stretcher was discontinued in sixteen days, and the patient was out of bed within four weeks.

The child died in convulsions on the seventh day, probably from cerebral injuries sustained in the attempt at forceps delivery.

Examination of the pelvis three months after operation revealed very little perceptible callus at the seat of the saw cut. Yet there was no false motion. The pelvic floor muscles seemed practically intact and there was no evidence of prospective prolapse. The cervix was normal. A cicatrix at the anterior vaginal sulcus extended from the left of the urethra to the level of the cervix. The condition of the pelvic floor in my case, in which the separation of the bones at operation was not less than 4 or 5 cm., does not bear out the observation of Tandler, who thinks the supporting power of the pelvic diaphragm is of necessity seriously impaired, owing to rupture of the ligamentum arcuatum and transversum, and injury to the transversus perinei and the levator ani muscles.

Of interest, apart from the woman's obstetric history, is the statement that she was one of twins in a family of twenty-four children. Her mother had twins three times and triplets once.

According to Bill, of Cleveland (*Surg. Gyn. and Obstet*, July, 1906), 157 extramedian pubiotomies with eight maternal deaths

have thus far been recorded. He found no reported American operation. Yet, J. A. Schmidt, of New York City (*N. Y. Med. Record*, May 26, 1906), publishes a case of successful hebotomy.

Bumm, Doederlein, Kaunegiesser, Van de Velde, and others, have each performed a considerable number of pubic sections, and numerous writers have taken very optimistic views of the value of the operation. It does not appeal to me as offering any material advantage over symphyseotomy. It is open to practically all the objections that obtain against median section. Its anatomic field is equally narrow, convalescence is quite as tedious and the after-care no less exacting. There is possibly not so much risk of bladder and urethra injuries, but these are preventable.

A better procedure than pubiotomy or symphyseotomy in very moderate disproportion, such that operation can be deferred to about the thirty-eighth week, is premature labor. The maternal mortality in such cases is almost nil and the fetal very small. Bar lost 8.6 per cent. of the children by induced labor, when the conjugate was between 9 and 10 cm., none when above 10 cm. The high fetal mortality of induced labor attaches only to higher degrees of contraction, 6 to 8 cm., c.v., as Bar's figures show.

DR. S. MARX.—I wish to place before you two cases of hebotomy which came under my observation, one direct, the other indirect, last spring and summer. Death occurred in the one case of hebotomy; failure on my part to separate or cut the bones because of breaking the saws was the result in the other case.

In the one case there was a rather small pelvis, which made me consider the limitations of advisability of symphyseotomy. I did not employ pubiotomy in this case, as the first measure, as this operation can never be made an elective one. There was absolutely no hemorrhage after attempting to saw the bone through, because I did the work subperiosteally. After making the incision I passed a stout needle, hugging the bone and separating the periosteum; but on attempting to saw, I broke three saws, one after the other, and I then had to do a perforation operation. Breaking the saw was due to my own fault, for, instead of sawing straight up and down, I did it in a semicircular fashion. The woman made a good recovery. I wish to emphasize that in this case, making the section subperiosteally, and so not coming in contact with the larger veins in the neighborhood of the symphysis, obviated the danger of hemorrhage, a danger not to be considered because of the hematoma which may form, but because of the danger of infection of the blood clot.

In the second case, symphyseotomy could again not be made an elective operation. Forceps had been tried, but failed. Hebotomy was not done subperiosteally and a severe hemorrhage

occurred. The separation was pronounced, at least two inches, and the child was delivered, after attempting to allow nature to take its course, with forceps; the child was born dead. The woman developed a slow degree of exhaustion and died on the tenth day, in all probability from the sepsis.

In spite of the death, and the failure recorded, because of the fragility of the saws, the operation of hebotomy does certainly appeal to me, because of the simplicity with which it can be done. But it cannot be made an elective operation, the field of its limitation being small. When we consider the field of limitation for version, between 9 and 10 cm., with an average size child and an average sized pelvis, and the limitation for Cesarean section at or under 6 cm., there is very little room left for symphyseotomy or hebotomy, providing we operate under justifiable indications. In a large series of cases, I have been able to place the indication for bone section in probably all in all three cases. Alternate operations, operating in the Walcher position, generally has given good results.

I believe that too many pubiotomies will be performed if done as an elective measure. In the minor contractions the child can be delivered by axis traction if version is contra-indicated; but where version cannot be done, axis traction will give splendid results. While the field for hebotomy is limited, I feel positive that if the condition should arise, I should do the operation again. It is a simple operation and it is superior to symphyseotomy, because of the small danger of wounding the urethra or the bladder.

DR. CHARLES JEWETT.—It is difficult to prevent breaking the saw. The saw often sticks. As to hemorrhage, I do not think that can be prevented by subperiosteal section of the bone since the plexus of veins just below the pubic bones anteriorly, the arterial plexus behind them and the crus clitoridis are likely to be torn by the separation of the bones. There is said to be also some bleeding from the cut ends of the bones.

DR. J. WILTON MABBOTT reported a

SECOND CESAREAN SECTION (BY DR. TULL) ON A PATIENT, WITH
RUPTURE OF THE UTERUS AT SITE OF THE
FIRST OPERATION.

The following case was seen in consultation with my colleague, Dr. E. E. Tull, at the New York Infant Asylum, November 4, 1904, and is reported by me at his request.

Patient, Negro; 23 years of age; married; native of New York city.

Family History.—Mother died of tuberculosis; one sister dead—cause unknown; the patient youngest of four children.

Personal History.—Rickets, measles, and chickenpox when a child. Menses established at 15 years, painful, and of six

days' duration. Her first child born August 21, 1902; Cesarean section. She nursed this child for a few months, but her milk gave out and the child, bottle-fed, died at 10 months, of gastro-enteric trouble.

Present Pregnancy.—About a year and a half from the time of her first delivery she again became pregnant, and continued working as a domestic servant, up to the evening before she entered the hospital. She had been having pains for about twenty hours when she stopped in a drug store and asked for assistance. She arrived at the hospital about 7:30 P.M., and walked without much assistance to the receiving ward, where she was prepared for examination. Pulse, 102; respiration, 24; temperature, 99.4° Fahr.

Inspection.—On examination we find a poorly-nourished woman of medium stature. Flat, beaded, rachitic thorax, left chest decidedly more prominent than right, cardiac apex beat not visible, breasts small and flabby, nipples not prominent, areola around nipples deeply pigmented. Abdomen symmetrically distended, umbilicus not prominent. Old scar in linea alba 9.5 cm. long. Labor pains at intervals of twelve to fifteen minutes, of short duration and no intensity.

Measurements of the Pelvis.—Between anterior superior spinous processes, 9 $\frac{1}{4}$ in. (23.1 cm.). Between crests of ilia, 9 $\frac{1}{2}$ in. (23.7 cm.). Diameter of Baudelocque (external conjugate), 5 $\frac{3}{4}$ in. (14.4 cm.). Estimated internal true conjugate of brim (about), 3 in. (7.5 cm.).

Ilia somewhat flattened, anterior-superior spinous processes flare outward. Left ilium and spinous process two centimeters above right and more prominent. Left leg three centimeters longer than right leg.

Palpation of Abdomen.—Impossible to make out fetus on account of tension and marked tenderness.

Percussion of Abdomen.—Negative.

Auscultation of Abdomen.—Impossible to locate fetal heart.

Vaginal Examination.—Outlet of pelvis roomy; bones present no excrescences; sacral vertebra very prominent, with antero-posterior shortening of brim. Brim of pelvis kidney-shape, with cartilage of symphysis projecting inward. Cervix soft; two fingers dilated; membranes intact. Vertex of fetal head presenting, with no attempt at engagement.

One hour after her arrival in hospital the patient consented to Cesarean section. Dr. George Tucker Harrison joined us in consultation, and concurred in advising castration also, for which the patient readily gave permission.

Operation.—After the usual preliminary preparation, under anesthesia, an incision was made in the linea alba through the old scar tissue, down to the peritoneum. Peritoneum opened in the usual way. Abdominal cavity found to contain a quantity of bloody serum and dark blood clots, possibly

a pint, which were gently wiped away. Uterus now exposed, found to be ruptured, with bag of waters protruding about as large as a fist, the membranes being intact. Primary abdominal opening now somewhat enlarged by extension of incision upward and to left of umbilicus. Uterus held firmly to anterior abdominal wall, and abdominal cavity further protected with gauze pads.

The rupture was found to be on the anterior surface, very near the upper border of the fundus, extending transversely between the two cornua, measuring seven centimeters, and being, evidently, a laceration through the cicatricial tissue at the site of the former Cesarean incision. A vertical incision was now made, extending downward six or seven centimeters from the middle point of laceration in the anterior wall of the uterus, resulting in a T-shaped opening, sufficiently large for delivery. The membranes were then ruptured, the fetus being rapidly extracted, together with the secundines practically *en masse*, and given in charge of an assistant. Cavity of uterus wiped dry. Placenta had been attached to posterior wall. Uterus now grasped with hand, contractions immediately supervened, with the result of but little hemorrhage. Interrupted through-and-through, No. 3 chromicized catgut sutures inserted down to, but not through the endometrium. Peritoneum reinforced with continuous fine catgut sutures. Gauze pads removed and abdominal cavity flushed out with saline solution.

Ovaries and part of tubes now removed. The abdominal wound was then closed in layers, and no drainage employed. Before removing patient from the operating-room table, the cervix was examined and found to afford free drainage.

The woman made an uneventful recovery and left the institution with nursing child twenty-nine days after operation.

Child at birth weighed six and one-fourth pounds.

I wish to acknowledge my indebtedness for a large part of the foregoing history of the case to Dr. Robert W. Kerr, of Newport, R. I., formerly house surgeon of the New York Infant Asylum, where the operation was performed by Dr. Tull and myself, assisted by Dr. Kerr and Dr. B. C. McMahon, of the house staff.

Through the courtesy of the Society of the Lying-in Hospital in the city of New York, I am enabled to state that the first Cesarean operation on this patient was performed by Dr. Adrian V. S. Lambert. The uterine incision, according to the history, began at the right cornu and passed over the fundus to a point slightly in front of and below the left tube. The wound was sutured in three layers with chromicized gut. The first layer escaped the endometrium and peritoneum, and was of interrupted gut. The second layer was a mattress suture, and the third layer was a continuous Lembert suture of the peritoneum.

The true conjugate diameter was recorded as 8.5 centimeters, slightly above our estimate.

In reporting this case we frankly confess that the diagnosis of rupture of the uterus was not made prior to opening the abdominal cavity. The woman did not present the usual picture of shock or severe hemorrhage. In other words, she was not really suffering from either of these conditions. Her pulse seemed fully explained by her previous malnutrition and the fatigue, suffering, and lack of nourishment incidental to twenty hours of ineffectual labor. The hemorrhage was actually found to be slight, and this we believe may be accounted for partly by the scanty vascular supply of cicatricial tissue and partly by the pressure exerted upon the lacerated edges of the rupture by the distended elastic bag of membranes found protruding through the opening.

The pelvic measurements, together with doubt as to fetal vitality, may be said to have invited efforts to deliver by forceps or version before resorting to Cesarean section. The simplicity and safety of the Cesarean operation under modern surgical conditions, however, commend this operation to obstetricians more and more in the interest of the mother herself.

This is a somewhat rare case. But such cases may become more common as Cesarean operations increase in frequency. From it we might formulate the principle that in a case of difficult labor at full term, with unruptured membranes, Cesarean section is the elective obstetric operation for a woman who has been previously subjected thereto, whether or not we personally should have selected it primarily. On the other hand, we cannot dogmatically recommend rendering a woman sterile on the occasion of her first or any subsequent Cesarean delivery, although in this case that course of procedure was determined upon before the uterine rupture was recognized. We leave that subject for individual consideration and judgment.

DR. CHARLES JEWETT.—As to rupture of the uterus at the cicatrix of a former Cesarean section, while I have never seen it, I do not think such cases are extremely rare. The scar of a previous Cesarean section is commonly mentioned among the predisposing causes of uterine rupture at labor. If I understood the doctor correctly he removed the tubes and ovaries and sutured the uterus; I would like to ask him why he did not do a hysterectomy, as being safer from the standpoint of possible sepsis and better for other reasons.

The case reported is of interest, because rupture took place at the site of the former incision, which was made at the fundus, at a point which some have claimed was the safest place in which to make the incision again; the rupture occurred in spite of the fact that the incision had been closed, layer by layer, with a chromic catgut. Whenever Cesarean section has been

performed, one must be on the lookout for rupture of the uterus during a succeeding labor.

DR. WILLIAM S. STONE.—There is another point of interest and importance regarding the case, namely, in regard to the etiology of ruptures at the site of the old Cesarean incision. There are numerous cases recorded in which the rupture has occurred in both the ordinary anterior incision and in the transverse incision, so that so far as preferring one incision to the other is concerned, that point does not maintain. I think it is unfortunate in working out the etiology of these conditions that, for example, Dr. Mabbott did not have sections made along the edge of the old tear. There has been some theoretical speculation regarding this; some have thought that these ruptures occur more frequently at the site of the placental implantation; others, however, have found that the rupture occurs outside of that site. During the past year cases have been reported where sections from the edge of the tear have been examined, which would offer a possible explanation as to why some of these ruptures occurred. The point has been made that in suturing the uterus great care should be used not to include the mucosa, not for the ordinary reasons given, namely, the danger of infection, but for the danger in having the mucosa caught between the musculature. In this way, possibly islands or foci of mucosa may be included and, in subsequent pregnancies, these islands or foci of mucous membrane will undergo the ordinary transformation into decidual tissue, in the same way that the whole mucosa undergoes a hypertrophy and hyperplasia. It seems quite reasonable to think of these islands of mucosa, situated in the musculature, undergoing decided transformation, and thus causing a softening of the wall of the uterus at that point.

DR. S. MARX.—The report of this case teaches us a valuable lesson, not insomuch as Cesarean section is concerned, but because these cases are not so very unusual. In view of this fact and because last spring a colleague came to this country and taught that operations on the uterine body, and especially the vaginal Cesarean section, were more often indicated. I think that if we should continue to do as is done abroad, you will see a great many more cases of rupture of the uterus subsequent to vaginal Cesarean section than you now do. This reminds me of the last time I met a certain gentleman who appeared before a local society and reported a case of eclampsia. He had been notified twelve hours before that because of the eclampsia he might be called upon to do a vaginal section. He did this operation after the expiration of twelve hours. This woman could have been delivered twenty times in those twelve hours by the use of the hand, the hydrostatic bags or by the introduction of the douche. The lesson taught is, that we should be exceedingly slow before deciding to mutilate the

uterus; for that is mutilation. In those cases which are urgent, and where the uterus must be speedily emptied, vaginal Cesarean section may be indicated; but if the fad continues to hold ground and is done indiscriminately, you will hear of many more cases of rupture of the uterus following vaginal Cesarean section.

DR. C. A. VON RAMDOHR.—From what I have seen of vaginal Cesarean section, and from what I have read, I believe that it is a good operation, but only in the hands of an expert.

Cesarean section is an excellent operation and is in advance of symphyseotomy, but I believe that it is overdone and that many such operations could be avoided. If it is necessary to do a Cesarean section we must have absolute asepsis. Cesarean section is a safe operation under these conditions, if performed at the correct time, and with clean hands.

DR. JOSEPH BRETTAUER.—I should like to ask Dr. Mabbott if there were any adhesions. I remember two cases distinctly where the site of the rupture was at the location of adhesions to the abdominal parietes. That, to my mind, would explain the subsequent rupture.

I agree with Dr. Jewett that a ruptured uterus should not be left when the ovaries and tubes have been removed.

DR. J. MILTON MABBOTT.—With regard to the question raised by Dr. Jewett as to the desirability of leaving the uterus in the abdominal cavity under the circumstances, I really do not feel competent to discuss this point. I do not claim to be a major gynecologist, having such work done for me by men of greater experience. Nevertheless, I feel that under the circumstances, Dr. Tull's judgment was good. The tear was a clean one, of about 10 cm., or 4 inches, and by making an incision at right angles, it was a simple thing to close the wound. It was also a simple thing to remove two ovaries, much more simple than to do a hysterectomy.

The criticism I expected was regarding the choice of Cesarean section, when there was not a much contracted brim, and where not the greatest pains were taken to discover whether the child was living or not. But the abdomen was so sensitive that without anesthesia further examination seemed inadvisable; the labor had lasted so long, with so little progress, that in consultation, and in view of the previous history, it was decided that this was a case for Cesarean delivery. We were surprised to find that the cervix had not dilated more after twenty hours of labor. With an exhausted woman under the anesthesia, it seemed useless to postpone delivery in making further efforts to ascertain the position or to determine the vitality of the fetus.

DR. GEORGE H. MALLETT presented a specimen of

TERATOMA

The specimen that is now presented I removed on May 31 of this year, from an unmarried woman, 32 years of age. Her previous history was uninteresting. Menstruation began at 16, and was regular every thirty days. She flowed six or seven days profusely, and suffered severe pain during the first two days. She menstruated one week before operation.

Six months before operation she began to have unusual menstrual pains and frequency of micturition. About the same time she began to have attacks of severe pain in the abdomen, and then noticed for the first time her increased waist measurement. Since then she complained of nearly constant abdominal pain, more marked bladder symptoms, and since then her abdomen has steadily grown larger.

Upon examination, a hard irregular mass was found, filling the abdominal cavity to the level of the umbilicus. The cervix uteri felt rather soft. The fundus could not be located definitely. Labia majora contained varicose veins, and the labia minora were somewhat cyanotic. A median incision was made and the tumor here presented was found adherent to the abdominal contents. After considerable difficulty it was separated from the omentum, intestines and peritoneal lining of abdominal wall, and from the bladder. It was then found to be attached to the top of the fundus uteri by a small pedicle, which was ligated and the tumor removed.

The patient made an uneventful recovery, and now declares herself to be in perfect health.

The pathological report is as follows:

"The tumor measured 7 x 7 x 5 inches, weighing three pounds exactly. It is made up of a vast number of small tumors, or nodules, varying from the size of a pea to that of an English walnut. These nodules are so grouped that they divide the whole specimen into a number of lobes. Many of the small tumors are discrete, simply joined to their neighbor by a connective tissue stroma and bloodvessels. The whole mass is firm and unyielding. A small pedicle passes into the tumor between two lobules. This pedicle consists of a round, tube-like structure, surrounded by a thin membranous envelope.

"On cut section the specimen is found to be very hard and gritty. In the center it is apparently undergoing degeneration.

"*Microscopic Examination.*—The stroma of the tumor is rather dense connective tissue. Supported in this stroma are great numbers of round, sharply-circumscribed areas of hyalin cartilage. This cartilage is regular and well organized. Here and there in the stroma are areas of poorly organized bone. Openings lined by one or two layers of low cuboidal

epithelium, exist, resembling the cross section of glands. Areas are also noted, which resemble smooth muscle fibers, together with a certain amount of adult fat.

"Section of the pedicle shows that its center is a Fallopian tube. The outer portion of this pedicle is apparently an infolding of peritoneum around the Fallopian tube.

"*Diagnosis*.—Teratoma, containing cartilage, bone, muscle, adult fat and glands.—WILLIAM COGSWELL CLARKE."

The portion of the report which states that the pedicle contains a Fallopian tube is, to me, puzzling in the extreme, since I can state positively, as can several gentlemen who either assisted me or witnessed the operation, that both ovaries and tubes were left intact, and there was no evidence of a double or bicornuate uterus. Several pathologists have examined this specimen, Dr. Prudden among them, and all agree as to the presence of the tube; indeed it is visible to the naked eye.

In looking through the literature of teratomata at my command, the most satisfactory paper that I found was that of A. S. Warthin, in the "Reference Handbook of the Medical Sciences."

He defines a teratoma as a tumor-like growth, characterized essentially by the fact that the tissue formation of which it is composed does not occur normally in the affected region, or at least not during that period of bodily development in which it presents itself. All the teratoid tumors are to be regarded as congenital tumors, even when developing very late in life. The persistence of undifferentiated aulage in a latent condition for years has physiological analogues in the late development of the beard, patric hair, wisdom teeth, etc. Many authors do not accept the congenital origin of these growths, and assign to them a development from endothelium, or explain their mixed structures as arising from a metaplasia of other tissues.

The tumor presented, I think, is a complex teratoma, and from its resemblance in structure to a dermoid cyst of the ovary, I take it to be a solid teratoma of the ovary, and yet, how to explain the fact that the patient has two healthy ovaries, I am at a loss.

DR. CHARLES JEWETT.—An interesting question in connection with this case is the genesis of teratoid tumors. Abel says teratomata are of the same character as dermoids, except that lacking the derm they develop no liquid contents. Their origin in the ovary and in certain other locations he refers to remnants of the Wolffian duct.

DR. H. N. VINEBERG.—I have operated upon two such cases, and in both there was some resemblance to a fetus. The case shown here by me two years ago looked like a deformed fetus. There were two lower extremities and two upper extremities. From the history given of this case it might be an adenomyoma, which has undergone degeneration. This tumor was attached

to the uterus and was irregular in form. There was glandular tissue present, and this occurs in fibromyoma. It seems to me it does not correspond, even in its gross appearance to a teratoma.

DR. H. C. TAYLOR reported a case of

PRIMARY EPITHELIOMA OF THE VAGINA.

This patient first came to me in September, 1899; at that time was 53 years of age; had had one child twenty-three years before and two or three miscarriages; there had been no irregularity in the menstruation; menopause at 47 years. The one symptom of which the patient complained was an offensive, bloody discharge for the previous six months. On examination, there was found, just under the urethra, about one-half inch back from the meatus, a growth which had the appearance of a papilloma. After its removal, the microscopic examination confirmed the diagnosis.

About three months later the patient returned to me with a growth in the same location that clinically had the appearance of an epithelioma, and this diagnosis was confirmed microscopically, after the removal of this growth. The recurrence in the location of the papilloma raised the question of the correctness of the diagnosis of papilloma of the original condition, but a re-examination of the first specimen gave the same report. A third time within the year the patient came to me with a similar growth, and having in mind the last pathological report of epithelioma, I removed the entire vagina, with the exception of a small strip under the urethra and around the cervix, which seemed free of the disease. This time the patient remained well till 1904, that is, for four years, when she returned, with a recurrence near the opening of the vagina. This growth was removed with the cautery. In August, 1906, the patient returned for the fifth time, complaining of a discharge from the diminutive vagina. As it was not possible to make a vaginal examination, she was sent to the hospital, given an anesthetic, and the cervix exposed by an incision through the perineum. A recurrence of the disease was found in the cervix, and a vaginal hysterectomy was done, removing also any of the vagina that was left at the previous operation.

The interesting points in the case are: First, the origin of an epithelioma in a papilloma. Second, the low grade of malignancy, as shown by the time that has passed since the first operation. Third, that the extension of the disease has been entirely along the mucous membrane and not through the deeper structures.

DR. HERMAN J. BOLDT.—With regard to the malignancy of these tumors, it occurred to me that even in young persons

malignant disease may continue for a long time before a fatal termination. I remember one instance in which a young woman in the middle twenties had malignant disease for seven years. This feature is extremely interesting and not in harmony with the general experience we have had with malignant disease in young persons. Usually the disease progresses very rapidly. The most careful examinations fail to explain why; it seems to be merely a clinical fact.

DR. BROOKS H. WELLS.—The question of the predisposition of papillomata of a mucocutaneous junction to become carcinomatous is interesting. I have had two cases of primary epithelioma of the vulva, in which the women had for years a whitened scaly warty condition at the labia. In one of these patients I advised to have this whitened skin removed, because of the suggestion that it might be the starting point for cancer. Operation or treatment was refused, and two and a half years later she came to me again with an epithelioma.

DR. JOSEPH BRETTAUER.—When operating for malignant growths of the vagina or vulva, it is necessary to remove the inguinal glands. Some time ago I reported three cases of carcinoma of the vulva, in all of which there were recurrence, which had taken place in these glands.

DR. JAMES N. WEST.—I have recently seen a case of primary carcinoma of the vagina situated in the upper and right side. The growth was examined by the pathologist at the Post-Graduate Hospital and pronounced an epithelioma. I was consulted in order to determine whether it was inoperable or not, and I decided against operation.

The point Dr. Brettauer brought up is an interesting one, and I had a similar experience recently. A case was referred to me because of a little irritative process upon the right labium; it looked like eczema. There were no evidences of malignancy about it. The woman had some relief by scratching the parts. The condition about the clitoris was relieved and the patient was placed in good condition. Still the condition persisted, and then she began to show signs of malignancy. I suggested the use of the x-ray, having been informed that the x-ray was of value in these superficial growths. It grew rapidly under this treatment, and in three weeks' time increased from the size of a ten-cent piece to the size of a quarter. The woman was placed in the hospital and the whole labium excised, together with all the tissues within one-half an inch from the growth. One year later I was called to see her again, and found the inguinal glands large and immovably fixed, attached to the structures beneath. On attempting to remove them I found that the epithelioma was attached to vessels and extended to the peritoneal cavity beneath Poupert's ligament. It was inoperable.

DR. HOWARD C. TAYLOR. My impression of the case was,

that it extended by direct extension rather than by metastases. At the time of a previous operation a little of the vagina was left around the cervix, and at the last operation, in August of this year, it was found that that portion of the vagina which was left at the previous operation was involved and probably by direct extension rather than by metastases.

It is easier to believe this to have been by direct extension than to consider it a metastatic process.

DR. W. S. STONE reported a case of

REPEATED TUBAL GESTATION.

Patient was 27 years of age. No history of previous pelvic diseases, although the possibility of a gonococcus infection from her first husband could not be excluded. She was first married eight years ago. Two years later she was operated upon for a ruptured tubal pregnancy of the left side. Since then has been perfectly well, except for extreme nervousness. Married a second time two years ago. In April, of this year, the menstruation came on at the regular time, but continued a little each day for eight weeks without any pain. Examination revealed a retroverted and adherent uterus. No swelling could be detected on either side, and there were no evidences of pregnancy. An intrauterine exploration, under an anesthetic, revealed no evidences of decidual formation. No pain or bleeding until the next day. An acute attack of severe pelvic pain was immediately followed by symptoms of moderate shock. The entire abdomen was more or less tender, but nothing could be felt per vaginam. A few hours later the tenderness seemed to be more localized over the region of the appendix. The diagnosis, however, of appendicitis seemed uncertain. Operation performed fourteen hours after the first attack of pain through the regular appendix incision revealed a ruptured tubal pregnancy of the right side, which was easily removed through the appendix incision. The absence of physical signs in the pelvis was found to be due to adhesions from the previous operation, by which the mass was placed high in the pelvis, not permitting any accumulation of blood in the pouch of Douglas. An uninterrupted recovery followed.

DR. H. N. VINEBERG.—The report of this case was interesting, in reference to the absence of pain. It is very rare to have a case go on without having very characteristic pain. That the patient did not pass her period is an experience frequently met with, perhaps in one out of ten cases. In 53 cases that I have had there were 5 in which there was absolutely no absence of menstruation.

The question may be raised that when one operates for an ectopic, the tube and ovary should be removed on the other side, on the supposition that she might later have an ectopic

on that side. I think such a procedure is unjustified. I know of one woman upon whom I did the operation for ectopic pregnancy, and who, three months later, became pregnant and went on to and through a normal pregnancy. It is best to be conservative. In Germany they go further; they do not remove the tube, but slit it up and remove its contents and then sew it up again.

DR. CHARLES JEWETT.—A case of repeated tubal pregnancy came under my notice in June last. Dr. Bristow, of Brooklyn, removed the right tube for a pregnancy which had terminated either by rupture or abortion. Five months before, in January, he had operated upon the same woman for gestation in the left tube.

In one or two cases, instead of removing the pregnant tube, I have cleared the tube of the gestation products, sutured it and left it. An objection to this is the danger of another pregnancy in the same tube.

DR. HERMAN J. BOLDT.—The question might arise as to the treatment of inflamed tube on the opposite side, when it is present in cases of tubal gestation. I know several instances in my own experience where women were operated upon for tubal gestation, and later had an ectopic in the other tube. Such instances occur not infrequently. The question that arises is, when we find a catarrhally-inflamed tube, shall we excise it? I have not done it for the reason that we do know that these catarrhal inflammations frequently heal spontaneously. This is a very important question to decide, but observations are not sufficiently large to allow us to draw conclusions. At present time I take the ground if there is no marked disease on the other side, leave the tube alone.

HOWARD C. TAYLOR.—The question of leaving in the tube which is the seat of an ectopic pregnancy is one of interest to me. There are certain cases in which one is justified in doing so. I remember one case seen recently in which I operated for retroversion, having no idea that the patient had an ectopic pregnancy. One tube was distended; I made an incision in it and enucleated a blood clot. Examination of it proved it to be an ectopic. I can see no reason why we should remove these tubes. The tube was sutured, and I think that tube was in better condition than are many which are in an inflamed condition and which we leave in. Such a tube might undoubtedly well be left. Take a case that is the seat of a tubal abortion; we open the abdomen and clean out the blood clots; the bleeding has practically ceased. Such a tube is in a fairly good condition and may not have to be removed. I do not think that a tube, the seat of a tubal pregnancy, is any more diseased than many of the tubes we leave in.

DR. JOSEPH BRETTAUER.—We all have seen cases upon whom we have operated for tubal pregnancy and found the

process terminated; nature has taken its course, the tube being entirely emptied of its contents. Of course, a tube like that might be left. But there are other cases where you find blood clots still in the tube which was the seat of a tubal pregnancy; how are we to know that growth of the decidual cells in the tubal walls has stopped? That is very often the reason of the hemorrhage following tubal rupture. We have no way to find out macroscopically, and therefore I believe it safer to remove such tubes.

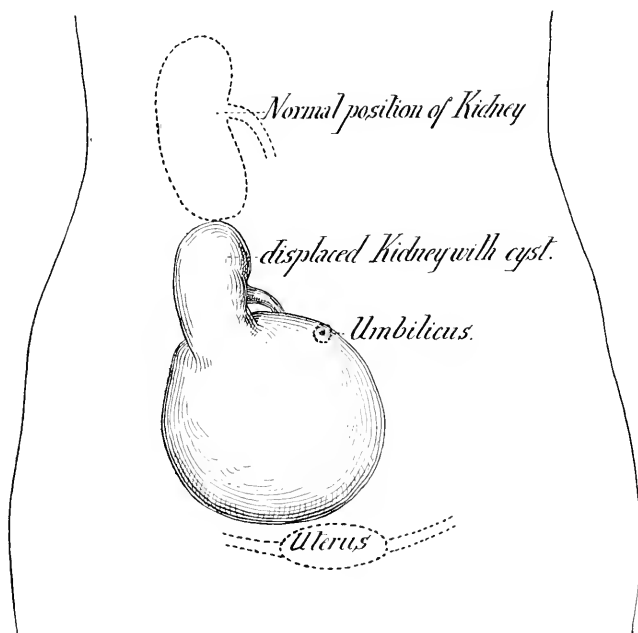
DR. W. S. STONE.—Dr. Brettauer's argument is a good one for the removal of the tube in tubal pregnancy, especially as there is more chance for the continued growth of these cells, because unlike intrauterine abortion, the tube is apt not to be so thoroughly cleaned. In the diagnosis of malignant disease following abortion it has recently been shown that it is considered important to know whether the uterus has been absolutely cleaned of its contents. The microscopist to-day, in many cases, will not make a diagnosis of malignant disease, unless assurance is given him that the uterus was absolutely clean. In other words, not unlike the irritative effect, when the uterus contains the remains of gestation products, the cells grow more or less, perhaps, physiologically, but often become of pathological importance. Dr. Brettauer's argument is of more than theoretical interest.

DR. F. J. BOLDT presented a

LARGE CYST CONNECTED WITH THE LOWER POLE OF THE RIGHT KIDNEY.

S. J., referred by Dr. J. A. Price, September 18, 1906; aged 33 years; had had four children during nine years of married life, the last four months ago. Since the birth of her last child she had noticed a gradual increase in the size of her abdomen, so that it is now distended by a tumor which causes a prominence like a seven-months pregnancy. Examination shows the tumor to be apparently a monolocular cyst, reaching downwards to about a finger's breadth above the symphysis and upward to a little above the umbilicus. Its most prominent part is to the right of the median line. From this, for a moment the thought of a kidney tumor occurred, but when on further examination it was found that the tumor could readily be pushed over to the left side of the abdomen, and that, while the right ovary could be palpated, the left ovary, although carefully searched for, was not palpated, the connection of the tumor with the kidney was dismissed and the diagnosis of a left monolocular ovarian cyst with a long pedicle was diagnosed, especially so because no intestines were in front of the tumor. When the abdomen was opened on September 21, the prominent globular surface of the tumor popped out of the incision, when

it was seen that the tumor was covered by highly vascular posterior peritoneum. The intestines had been pushed aside by the prominence of the tumor. The exposing of the tumor presented no difficulty. As may be seen in the illustration, the cyst and the lower pole of the kidney are one so that simple enucleation was out of question. Therefore, the lower pole



of the kidney was excised with the cyst by an elliptical incision, and the kidney structure sewn together after tying the bleeding vessels. The wounds were then closed. The reason why the left ovary was not palpated was found to be an upward displacement of the gland and its fixation to the brim of the pelvis by a slight adhesion.

The examination of the cyst fluid showed as follows:

Amount.	1,200 c.c.
Appearance.	thin
Color.	brownish black (very dark)
Reaction.	acid
Specific gravity.	1.024
Albumin.	present (boiled solid)
Sugar.	faint reducing power
Urea.	0.5 per cent.
Red blood cells.	very numerous

Microscopic.—Kidney structure farthest from cyst normal. Near the cyst the tubules are distorted, some flattened, some dilated. The epithelium shows granular degeneration. The kidney substance is separated from the cyst by a thin layer of dense connective tissue. From this, bars of connective tissue run a short distance into the kidney substance.

DR. BOLDT also reported an

UNUSUALLY LARGE CYSTOFIBROMA OF THE UTERUS.

M. R., aged 41 years, married nine years, never pregnant. Her menstruation began at the age of 13, was always regular, of three to four days duration, and moderate in quantity. The last two months she had not menstruated. The woman complained principally of the enormous weight and enlargement of her abdomen. It was remarkable that with such tumor there should not have been more serious symptoms.

The tumor was so large, and the cystic structure so evident that in the absence of a typical bleeding or even profuse menstruation, the diagnosis of a large ovarian tumor was made. On operation, July 12, 1906, it was found that the omentum was universally adherent to the tumor, and the veins enormously distended, from one-quarter to half an inch in diameter. The intestinal adhesions were equally firm, so that in several places they were injured in separating the adhesions; the repair of the intestinal injuries, however, presented no difficulty. The bladder was dislocated far up and to the left. Owing to the distortion and matting together of everything in the abdomen the bladder, although its contours were carefully looked for, was not entirely recognized until a small piece had been cut out with some adhesions; it was readily closed with catgut. The base of the uterus had lost its normal contours and was very broad, owing to the retroperitoneal development of the myoma which in part had begun in the cervix. The right ovary had been transformed into a large hematoma, and its corresponding tube was much thickened by interstitial salpingitis. The left adnexa were seemingly normal and were not removed. A panhysterectomy was done and the abdomen drained per vaginam because it was impossible to control the profuse oozing from the adhesions which had been separated without making use of tamponade. A permanent catheter was placed in the bladder. For the first twenty-four hours the patient progressed favorably, but after that she began to sink, and died two days subsequent to operation, seemingly from heart failure. Macroscopically, the specimen was thought to be fibrocysto sarcoma; this, however, was not borne out by the microscopical examination.

The pathologist's report is as follows:

The specimen is a large irregular multilobulated tumor, surrounding and involving the irregularly enlarged, pear-shaped uterus 15.5 by 14.5 cm., the entire mass measuring about 23

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by 31 cm. Sections were taken from various parts of the uterus and from various portions of the tumor, some of which were firm, others cystic, containing clear serous fluid, and others filled with blood. The uterus, on section, shows a number of fibroids. The bloodvessels supplying the tumor are large, thick, and in general the tumor is exceedingly vascular.

The structure of the various sections is quite similar throughout. The tumor is composed of bundles of fibrous tissue, some denser peripherally and spongy centrally in the form of areolar tissue, or as cysts, filled with blood. Some sections show increased vascularity and new formation of bloodvessels. The bloodvessels are much dilated, thin walled, and very numerous in those parts less dense, and more of the nature of areolar tissue; less so in the walls of the cysts which are simply condensed bundles of fibrous tissue. Most of the tumors show no cystic degeneration, are quite firm, composed of fibrous tissue and fibroblasts. The uterus shows the same fibrous tissue in the form of interstitial large fibroids, together with hyperplastic and atrophic glandular endometritis.

DR. H. N. VINEBERG.—The first case shown by Dr. Boldt resembles one that I operated on three years ago in the hospital. These cases should be shown more and should be brought more to the attention of the general practitioner, because he looks upon them as being benign, and he tells such patients that there is no danger. This patient had a growth in her abdomen for three or four years; she was examined by a general practitioner and was told to leave it alone. When she came to the hospital the tumor filled the whole lower half of the abdomen and the cervix could scarcely be felt. On the left side was a hard mass which I took to be a fibroid. In front was a cystic mass which I thought was a large cyst of the ovary. Upon opening the abdomen I was impressed by the fact that the lower part of the peritoneum was high up. The hard mass on the left side proved to be a fibroid uterus, consisting of two or three masses. The large mass in front was a subperitoneal growth. The case offered some technical difficulties, but the patient recovered.

DR. G. G. WARD, JR.—I should like to ask Dr. Boldt if the patient from whom he removed the very large cystomyomata of the uterus was allowed to get out of bed after recovering from the anesthetic, as is his usual custom.

DR. JAMES N. WEST.—I should like to ask Dr. Boldt how he treated the rent in the kidney.

DR. HERMAN J. BOLDT.—I united the "V"-shaped incision that was made.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of April 6, 1906.

The President, G. N. ACKER, M.D., in the Chair.

DR. FRY reported

A CASE OF ECTOPIC PREGNANCY.

Y., colored; aged 27 years; had one child when she was 12 years old; married and never pregnant since; menstrual period missed March 6th; entered Garfield Hospital Monday, April 2d; abdomen distended; dullness on percussion; very sensitive. Bimanual examination negative on account of sensitiveness; pulse, 94; no collapse or signs of severe internal hemorrhage; temperature elevated about one degree.

Diagnosis: Ectopic pregnancy; ruptured sac; no active hemorrhage.

Operation appointed for next day. Opening abdomen followed by gush of about three pints of fluid blood and clots. Embryo found. Two days after operation decidual cast expelled.

DR. FRY also showed a large

FIBROID TUMOR.

X, colored; aged 43 years. Large fibroid, extending to the epigastrium, with pedunculated mass in contact with the under surface of the liver.

Has been pregnant three times, but aborted, with excessive hemorrhage. Menstruation profuse; mitral regurgitant lesion; hyaline casts and albumen in the urine. Case of interest on account of large size of growth and unfavorable conditions for operation. Usual preparatory diet omitted and patient fed up and stimulated. Operation performed at Garfield Hospital April 3, 1906. Tumor weighs $11\frac{1}{2}$ pounds; length, 9 inches; width, 7 inches; thickness, 6 inches. Bowels moved voluntarily on second day; no vomiting; kidney action good; heart action bad and rapid first forty-eight hours; respiration labored. Nitroglycerin, strychnine, digitalis, whiskey, hypodermoclysis brought patient through the crisis. She seemed to be getting along well when she collapsed on the third day and died.

DR. FRY also showed a

SUBPERITONEAL APPENDIX.

Specimen, six inches long. No mesoappendix. It passed from the usual site of attachment towards the middle of the abdomen for four inches, bent at acute angle, and two inches directed outwards. V-shaped, with the angle towards the middle line.

DR. VAUGHAN said that he had a case of chronic appendicitis in a young girl who had suffered from several attacks. When the abdomen was opened he could not find the appendix. He did find some enlarged glands in the neighborhood of the cecum, and in incising the peritoneum he found the appendix behind the cecum. He had seen a number of cases where the origin of the appendix was retroperitoneal, but this is the only case which he has had where the whole organ lay behind the peritoneum.

DR. FREMONT SMITH said that it is, at times, difficult to make a diagnosis between appendicitis and ectopic pregnancy. He cited a case where a lady was taken ill on a train. She suffered from pain in the right lower abdomen, rigidity of the abdominal muscles, and had other symptoms of appendicitis. At operation she proved to have an ectopic pregnancy.

DR. T. C. SMITH said, in regard to the case of fibroid tumor, that he had seen a case at the Freedman's Hospital where there was a large tumor, with a full-term pregnancy. The tumor was first removed, then the child, and lastly a Porro's operation was done. The patient recovered.

DR. G. BROWN MILLER reported a case of

CHRONIC INTUSSUSCEPTION.

Mrs. F., 26 years old, complained of frequent attacks of abdominal pain, vomiting, constant diarrhea, and loss of weight and strength. Her illness began four years ago, with severe pain coming on without known cause. The pain was chiefly in region of the vermiform appendix, but radiated over the whole abdomen. The pain was accompanied with diarrhea and vomiting. Since the first attack there have been recurrences every week or ten days, while the diarrhea has been almost constant, there being several stools each day. No blood was ever noticed in the stools. She has lost thirty to forty pounds in weight, and is very weak and emaciated. Her attacks have been pronounced appendicitis by several physicians who have seen her. She has also been treated for chronic colitis without benefit. The examination revealed a freely-movable mass, the size of a small kidney, in the region of the cecum. The mass was firm, tender, and gave a dully tympanitic note.

The colon could be distinctly palpated, being much thickened and very tender. The mass could be distinctly followed from the cecum to a point a few inches from the termination of the transverse portion, where the thickening abruptly ceased. The right kidney and right ovary could be made out as distinct from the mass. Examination of the rectum and sigmoid showed a chronic inflammation. The diagnosis wavered between chronic intussusception, tuberculosis of the colon, and tumor of the cecum. The provisional diagnosis was chronic intussusception. Operation revealed an intussusception of the ileocolic variety, involving the appendix. The intussuscepted gut extended to within 10 cm. of the splenic flexure of the colon. It was impossible to reduce the intussusception without extensive dissection, so a lateral anastomosis was done between the ileum and the colon a few inches below the lower end of the invaginated bowel. Connell's suture was used, reinforced by a running peritoneal suture. She made an uninterrupted recovery, and is now, six weeks after operation, entirely free from pain, diarrhea, and indigestion. She is rapidly gaining in weight.

DR. VAUGHAN has had a number of cases of intussusception, but they have been in children. He has also done the lateral anastomosis between the ileum and colon for malignant disease of the bowel. He formerly used the Connell suture, but now uses a running catgut suture through all the coat of the bowel, at the edges of the incisions into the gut and a second running suture through all the coats, except the mucous one outside this. This method of suture has been perfectly satisfactory.

DR. E. E. MORSE read the essay of the evening:

INDUCED LABOR AS A CONSERVATIVE OPERATION IN CONTRACTED PELVES.*

DR. D. W. PRENTISS said that in determining the necessary procedure in contracted pelves, many points must be considered; as, the general condition of the patient, complicating diseases, whether she can be taken to a hospital, her religion, and her maternal instincts. There are so many points to be considered that no fast rules can be laid down; but in moderately contracted pelves, labor induced at seven and one-half to eight months is generally to be preferred to Cesarean section.

DR. FRY does not feel like giving up symphyseotomy. In contraction of the antero-posterior diameter it is at times useful. In one of his last cases of Cesarean section he considered symphyseotomy. There was a projection forward of the sacrum. The tentative use of the forceps was unsuccessful. He proposed symphyseotomy or Cesarean section with the sterilization of the woman. Her family preferred the latter. The patient died from an unforeseen accident. She became enormously distended in the upper portion of the abdomen. The use of

*See original article, page 824.

salicylate of eserine caused the bowel to move with escape of flatus, but the patient died. Autopsy showed an enormously distended stomach, caused by a twist in the upper portion of the duodenum. The mother and child might have lived if symphyseotomy had been done. Induced labor is almost obsolete now in the treatment of labor with contracted pelvis. Men who have studied most and written most on the subject line up against it on account of the high infant mortality. It is difficult to tell the size of the child. One sign that is important in determining the size of the fetus is the rapidity of the heart sounds. Below 130 per minute the child is apt to be large; between 140-150 the child smaller. The fine points of pelvimetry are nonsense and to talk of a one-half inch shortening of a diameter is absurd. One should first determine the character of the pelvis, then try to make out the internal diameter, and whether the head will fit into pelvis. The latter can best be done by one hand in vagina and the other in the abdomen, pushing the fetal head into pelvis. As long as this can be done, let the case alone. Induced labor has a limited field, and should never be used in just minor pelvis. In rachitic pelvis, 9 cm. internal conjugate is the limit (the other diameters being normal), and labor should be induced at eighth month.

DR. TRUMAN ABBE asked whether or not any of the members of the society had tried to measure the fetal head inside the uterus. Dr. Stone of New York claims to be able to get measurements within one-fourth inch of the true ones by this method.

DR. W. M. SPRIGG believes it to be impossible to measure the fetal head before birth in primipara. In multipara he has measured the size of the head frequently, using his hands to obtain the measurements. Indication of premature labor is rarely indicated in the city, but in country districts the procedure is frequently a wise one. In flattened pelvis the procedure will give much better results than allowing the patient to go to term.

DR. FRY thought it most important to determine the relation of the head to the pelvis. If we grant that Dr. Stone has measured the occipitofrontal diameter, it is of little importance. The biparietal diameter is the important one to determine. In inducing premature labor, Krause's method is the one to be preferred. A sterile bougie is to be inserted between the membranes and the uterus. It may be necessary to reapply it more than once. One should use the bougie and not the catheter as the latter will be more apt to infect the woman.

DR. MORSE said the object of the paper was to show the value of induced labor in cases where efficient surgical aid could not be secured. No pelvimetry will give accurate measurements. It is much more important to determine the relative sizes of the head and pelvis.

Meeting of April 20, 1906.

The President, G. N. ACKER, M.D., in the Chair.

DR. SPRIGG reported two cases of

VAGINAL STENOSIS COMPLICATING LABOR.

Vaginal stenosis, from a slight narrowing to almost complete closure of the canal, may be congenital or may follow any of the acute infectious diseases, notably scarlet fever, diphtheria, smallpox, cholera, sepsis, or it may result from any injuries or inflammations of the vagina in which scar tissue is formed.

The two instances which are here reported are cases of slight congenital constriction of the upper or superior third of the vagina. The first case was not seen until the first stage of labor was complete and not recognized until the application of forceps. In the second case the condition was recognized before pregnancy, but was thought to be of minor degree, so that the fetus would easily produce dilatation at the time of labor.

CASE I.—Mrs. A., white, age 24, primipara. Robust health as a child, chickenpox at 9; measles at 13 years. First menstruated at 14; is always irregular, at intervals of from three to seven weeks; lasts four days; always attended with severe pain in abdomen and back. Sexual relations normal.

This case was seen in consultation at ten o'clock on the morning of June 17, 1905. The patient had arrived at term, the bag of water had ruptured at 5 P.M. June 16, followed by slight pain. By 9 P.M. the pains had become severe and continued until between 4 and 5 A.M. of the 17th, when they became markedly less; the cervix was well dilated and to stimulate contraction of the uterus ten grains of quinine had been given without appreciable effect. Position: the patient was very nervous, the pains slight and not expulsive. The os was dilated fully, the head engaged L. O. A., at the superior strait, where it had been for six or eight hours, without making progress. Fetal heart sounds feeble.

Chloroform administered, catheterized and Tarnier's axis traction forceps applied. With a moderate effort, the head engaged and began to descend, when an obstruction was reached. I then recognized that there was an annular constriction in the upper third of the vagina, which had the feeling of a loop stretched around the forceps.

The constriction did not seem severe and I thought it might dilate before the head, so we made intermittent traction, taking about thirty-five or forty minutes to deliver the baby. There

was not much hemorrhage and only a very moderate amount of force had been used in the delivery. In making traction I kept one finger against the lateral vaginal wall, so as to appreciate how much tension I was making upon it, and as I made traction I felt the lateral wall give way. The vagina had split on the left side from the cervicovaginal junction through to the vulva. It was repaired with catgut in the vagina and externally silk-worm gut sutures. She has experienced no ill effect from the tear and reported a few days ago that she had less backache and menstrual pain than before delivery.

CASE II.—Mrs. B., age 24, Primipara. Came under observation in March, 1904. Well developed, has the appearance of robust health. Had diphtheria when a child. General health excellent. Menstruation began at 14 years; irregular and painful from beginning; would occur at from four to seven weeks, then she would not menstruate for three or four months; had recently gone eleven months. Had backache, and at the time of the month she should menstruate would have severe headache.

Uterus normal in size, slight retrodisplacement. The upper third of the vagina was slightly narrowed and the vaginal wall seemed thickened at this part. Last menstrual period, September 12, 1904; duration, three days. Was delivered July 5, 1905. After the fourth month of gestation she had some edema of feet and ankles. Examination of urine at short intervals was negative. I had directed that a specimen of urine be sent in on Saturday, July 1, but it was not sent. On Monday morning, July 3, I saw the patient; she had been having backache, which was progressively increasing; feet and hands and face were edematous. The time of her expected delivery had passed. I sent her to a hospital and ordered exclusive skimmed-milk diet. That afternoon the urine was examined by Dr. Snowden.

	JULY 3	JULY 4	JULY 5	JULY 11	JULY 30
Specific gravity...	1.009			1.004	24-hr. quan., 3cxxx, 1.002
Color.....	Dark amber.			Normal...	Pale straw
Odor.....	Foully am.			Normal...	Normal
Reaction.....	Alkaline.			Slight acid.	Slight acid
Albumin.....	95% per vol.	Vol.: A.M., 40% P.M., 10%	Vol.: A.M., 8% P.M., 5%	Present...	Trace
Sugar.....	Negative				
Urea.....	Gr. xii to 3i			Gr. iii to 3i	Gr. iv to 3i
Microscopic ex. not made		Granular and hyalin casts		No casts.	No casts

The patient was required to drink large quantities of water, from one to one and a-half gallons, daily. At 4 A.M., July 4, pains began, not severe; at 6 A.M. the membranes ruptured with escape of a large amount of amniotic fluid. Labor pains were active for a few hours, and gradually lessened until 11 A.M., when they practically subsided. The headache had increased.

The patient seemed considerably exhausted, her pulse became more rapid, the fetal heart sounds were less distinct. The condition was that of impending eclampsia. The uterus was dilated manually (Harris' method) from 11 P.M. until 1 A.M., when chloroform was given and forceps (Tarnier's) applied. The head in L. O. A. position, did not engage until forced to do so with the forceps; this did not require much force; but after head had engaged, a distinct obstruction was observed in its descent, into the vagina. We took one and a-half hours to deliver this case, making the traction by forceps stimulate labor pains as much as possible and hoping to dilate the vaginal constriction. Finally the vagina split as in the first case, but on the right side, beginning at the cervicovaginal junction and extending downward and forward along the right sulcus and through the vulva. This was repaired as in the former case. In this case there was a unilateral laceration of the cervix.

The patient sat up in three weeks and recovery has been complete.

The interesting feature of this subject is the etiological factors causing the varying degrees of vaginal stenosis.

The origin of longitudinal septa, as in double vaginæ is not difficult to understand, when it is remembered how the ducts of Müller fuse to form the genital tubes, and their subsequent absorption at the points of contact. This absorption takes place along the entire length of the canal from the fundus of the uterus to the hymen. If that part of the fused ducts which goes to form the vagina fails of absorption, a longitudinal band will remain, dividing the vagina into two compartments.

It has been supposed that a transverse septum represents a supplementary hymen. As the hymen arises from the urogenital sinus and fuses with the Müllerian canals at this site, it seems impossible that it should represent a transverse septum.

Verchère believed that transverse septa or bands are persistent remnants of the fusion of the ducts of Müller, and reasoned from the embryological fact that the vagina increased in length during fetal life.

Magendi-Huste says that the primary epithelial mass, which forms the vagina fails to be hollowed out, and if at the point of failure there is a defect in absorption, one or more transverse septa must result, either perforated or imperforate.

Delannay holds that the vagina develops in three sections, and if the middle portion did not undergo complete absorption, a septum would result between the middle and upper third, the same condition following in failure of the lower third to absorb.

Shroder and Brisky find that the various septa are the result of inflammatory processes during fetal life.

Huntington states that it is a reversion to an ancestral type. That there are still to be found in vertebrate life septa as a normal condition.

Brinkner writes that they are derived from an inclusion by Müller's ducts, of cells from the Wolffian duct or ducts, after the formation of the genital cord, and are therefore epiblastic in origin.

According to the teachings of Kollmann, the Wolffian body arises from the epiblast or ectoderm, and later develops into the most important excretory organ of the body, the kidney. To the outer side of and arising from an invagination of the mesothelium of the body cavity, the Müllerian ducts make their appearance. About this time the Wolffian ducts appear. Müller's ducts extend downward to join the urogenital sinus. Before this takes place, however, at the end of first month, there is developed upon the Wolffian bodies the genital ridges, the earliest traces of the sexual glands. From this time on the ducts of Müller grow downward and inward, by a proliferation of their cells, until they finally fuse together in the median line at the third month, and also the Wolffian ducts as they reach the pelvis, where they conjointly form the genital cord. From the Müllerian ducts are developed the tubes, uterus, and vagina. The Wolffian ducts atrophy in the female and are lost in the lower third of the vagina.

Diagnosis of constrictions and septa in the vagina should be easily determined by digital and ocular examination.

Treatment.—If a septum, by early excision and suturing vaginal wall. By incision and pack vagina so as to prevent contraction by scar tissue. Preceding labor by slow and gradual dilatation. During labor dilate with Champetier de Ribe's bags or with hands or incision of constricting bands or septa with button knife or blunt scissors or bilateral incision, or crucial incision.

Prognosis.—Grave according to contraction of vagina. Many cases end in death by prolonged labor, or by rupture of uterus.

Rupture of constriction with extension tear in vagina, has resulted in fatal hemorrhage. Neugebauer reported 237 cases in which birth either ended spontaneously or by the aid of forceps, with most varied results to mother and child. In many cases the child was born dead, and frequently the mother has suffered the result of a vesico- or rectovaginal fistula.

DR. FRY presented the specimen and reported a case of

FIBROID OF THE UTERUS WEIGHING EIGHTEEN POUNDS: UNIVER-
SALLY ADHERENT. BLADDER WOUNDED AND URETER ON
RIGHT SIDE CUT. RECOVERY.

M. P., colored; aged 36 years, married, III-para; first noticed lump in abdomen October, 1900. Menstruation became more profuse, and since November, 1905, tumor grew more rapidly and pain radiated down the thighs.

She entered Garfield Hospital and was operated on April 12

1906. The growth was adherent to the abdominal parietes anteriorly and laterally, posteriorly to the intestines, the cecum and appendix being attached. Adhesions also extended down into the pelvis. After removal of the growth it was found that the bladder wall was incised about two inches and the right ureter divided half-way between the bladder and kidney. The cervical stump was trimmed down, the bladder injury repaired, and an end-to-end anastomosis made of the cut ureter; some leakage required additional sutures. The ureter was fibrous and enlarged as big as the little finger. Gauze drainage was placed around the site of the ureteral injury and brought out of the abdominal wound. The tumor weighed eighteen pounds and is cystic on the right side.

The main point of interest is the injury to the ureter. The upper end could not be brought down to the bladder and it was too short to overlap and splice. The patient rallied well from the operation, has had no pain or abdominal distention and the gauze has not shown any evidence of leakage at the site of the ureteral injury. A retaining catheter has drained the bladder and the urine is not bloody.

DR. J. W. BOVÉE spoke of the treatment of tumors of the uterus from the standpoint of pathology instead of clinical symptoms. In connection with the ureteral anastomosis, he said that he preferred the end-to-end method. He believes that he was the first to do the oblique anastomosis. He did it to prevent cicatricial contraction, but it is probably not necessary. He spoke of the various methods of ureteral anastomosis. When within two inches of the bladder the difficulty of technique is so great as to make the anastomosis less satisfactory than ureterovesical suture. Wounds in the upper portion of the bladder heal nicely if the bladder is drained.

DR. BALLOCH asked Dr. Bovée what the fate of the ureter would have been if it had been caught in the angiotribe.

DR. BOVÉE thought the angiotribe would have sealed the ureter satisfactorily.

DR. FRY said that the injury to the ureter might have escaped notice if there had not been an escape of urine when the clamp was removed.

The essay of the evening, read by DR. S. S. ADAMS, was entitled

THE SYSTEMATIC WEIGHING OF INFANTS.*

DR. LOREN JOHNSON opened the discussion. He spoke of the difficulty experienced in getting mothers to weigh their infants systematically. He does not believe in feeding infants during the first few days of life, nor does he believe in weaning them at the end of one week if they have not gained in weight.

*See original article, page 832.

The mother's milk frequently improves at a later period in both quantity and quality. He thinks the analysis of the mother's milk should be made and the deficiencies supplied by modified milk.

DR. FRY presented charts of daily weighing during the first three weeks of life. He believes that systematic weighing of infants should be practised.

DR. LEECH believes in weighing infants who are not progressing satisfactorily, but does not see the necessity for weighing all. He does not believe in the use of cow's milk in the very early days of an infant's life, nor does he believe in early weaning if it can be avoided.

DR. ABBE said that in the New York Lying-in Hospital milk sugar solutions were used to prevent the early loss of weight.

DR. SOTHORON said that artificial feeding in the first few days tends to make breast feeding more difficult later.

DR. ACKER does not believe in early weaning. In one of his cases, 40 years old, the nursing for the first month was unsatisfactory, but she finally nursed the infant eighteen months. He believes the baby should not be weaned until the conditions are as favorable as possible. Careful weighing should be practised, the physician superintending the process. He does not think loss of weight should mean change of method of feeding unless other factors can be ruled out. He believes in the early feeding of the mother. Overfeeding at first may cause early gain, to be followed by later loss.

DR. JOHNSON said the early giving of water might easily account for cases where there is no primary loss of weight.

DR. FRY would give early milk feedings to avoid inanition fever. He does not advocate alternate feedings and nursings, but would let child nurse every two hours.

DR. ADAMS, in closing, said the cases to which he referred were all abnormal cases. He would not wean an infant if the analysis of milk showed anything to give hope that it would become normal. He thinks both breasts should be nursed each time. He feeds infants 1 + no. of months in ounces of food. More may be retained, but will not be digested.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF LONDON.

Meeting of October 3, 1906.

The Vice-President, AMAND ROUTH, M.D., in the Chair.

A short communication was read by DR. EDEN and MR. F LIONEL PROVIS on a case of

INTRALIGAMENTOUS, FIBROCYSTIC TUMOR OF THE UTERUS,

weighing about thirty pounds, removed by enucleation and subtotal hysterectomy.

J. S., æt. 55, single. In January, 1905, attended the Chelsea Hospital for Women, complaining of abdominal swelling, and a mucoid discharge from rectum. The menopause occurred at 48. For eleven months she had suffered from an ulcer on the left leg. The abdominal swelling was first observed in 1898, and had increased rapidly of late. Examination per abdomen revealed a large tumor of elastic consistency, reaching up nearly to the xiphoid cartilage, surface smooth with a distinct thrill. Per vaginam, cervix was found displaced upwards under the symphysis pubis, a firm swelling, rounded in outline, was felt in the left fornix and pouch of Douglas, apparently continuous with the abdominal tumor. The position of the uterus could not be made out. A diagnosis of multilocular ovarian cyst with a semi-solid portion in the pouch of Douglas was made.

February 14. Celiotomy performed, and the tumor found to be a fibromyoma of the uterus, spreading out into the left broad ligament and extensively raising the peritoneum from the left lateral pelvic wall and the abdominal parietes. The tumor was enucleated and the uterus removed by subtotal hysterectomy. Up to the ninth day the patient made excellent progress, when she complained of pain in the chest, her temperature rose to 100.4° , pulse to 116, respirations to 33. A pericardial friction rub was audible at the apex of the heart. In two days the rub had disappeared and the patient continued to make most satisfactory progress. March 7th-26th, day after operation—patient went to Convalescent Home. The next day she became very ill with vomiting and a temperature of 103° . In forty-eight hours the vomiting ceased, but she remained very weak, confined to bed, with a morning temperature of 102° , which fell to nearly normal in the evenings. In this condition she remained for a week, when she had several shivering attacks, in one of which her temperature was 107° , a loud systolic murmur

became audible at the apex, before this the heart sounds were clear. March 19 she suddenly became unconscious, developed left hemiplegia. On the following day she died. No autopsy could be made.

The immediate cause of her death was apparently cerebral hemorrhage or embolism, but it is difficult to connect it with the operation. Possibly the ulcer on the left leg may have been the source of an ulcerative endocarditis with secondary cerebral embolism. The tumor weighed thirty pounds, and is one of the largest on record, of its kind. It was attached to the left lower lateral border of the uterus by a pedicle one inch thick. The uterus measured two and a-half inches. The cut surface of the tumor showed a large cystic degenerating fibromyoma. Microscopical examination confirmed the naked eye appearances. The extensive cystic degeneration probably accounted for the rapid increase in growth noticed by the patient shortly before operation. As the tumor was attached by a distinct pedicle to the uterus it was regarded as uterine in origin, growing out in the left broad ligament.

MR. ERIC E. YOUNG, M.S.London, read a paper on

PRIMARY TUBERCULOUS DISEASE OF THE CERVIX UTERI

The rare occurrence of this disease affords the justification for submitting the following notes:

I. *History of the Patient*.—Married; age 26; husband alive, and found, on examination, to be healthy; three pregnancies, all of the three children healthy, the last born two and a-half years ago. Always healthy. Catamenia regular up to six months ago, since then periods of longer duration. Five weeks, thick, yellow, inoffensive discharge from vagina, and constant aching pain in lower abdomen and sacral region. Never any bleeding from the vagina. No family history of tuberculosis.

II. *Condition of Patient on Admission*.—Thin; nervous and excitable. Lungs examined on several occasions, and invariably found normal. No tubercle bacilli demonstrated in sputum. Slight tenderness on deep palpation experienced in the hypogastric and left iliac regions. No enlargement of the inguinal lymphatic glands. The cervix indurated and greatly enlarged, its surface uneven and ulcerated in places, and in places nodular and papillary; not friable on examination. Uterus freely movable.

III. *Treatment*.—The suspicious nature of the disease suggested vaginal hysterectomy, which was performed.

IV. *Present Condition of the Patient*.—Examined six months subsequent to the operation, and found to be quite healthy. No recurrence of the disease had taken place.

V. *Appearance of the Uterus After Removal*.—This is furnished in two photographs, and contained in the paper are a report by

the Clinical Research Association, and one by Dr. Williamson, the former stating that the lesion may be of tuberculous origin, and the latter expressing no hesitation in affirming the case to be one of tuberculosis of the cervix.

VI. *The Literature upon the Subject and the Discussion on the Case.*—The author then furnishes the results of his inquiries into the literature upon the disease, and sums up the conclusions to be deduced therefrom. In the light of the history of reported cases and of the examination and treatment of the present patient, he then discusses the nature of the case now presented, and the difficulties attending a differential diagnosis.

VII. The rarity of the disease, its etiology, pathology, symptoms, and treatment are briefly discussed.

DR. ROUTH congratulated Mr. Young on his paper and considered it would lead to more facility in making a clinical diagnosis before operation, instead of leaving the nature of the growth to be determined by microscopical examination of the removed growth. The paper would also lead gynecologists to modify their opinion as regards the relative frequency of primary tuberculosis of the Fallopian tube as compared with that disease primarily affecting the cervix uteri.

DR. HEYWOOD SMITH suggested that the case might be one of areolar hyperplasia of the cervix.

DR. LEWERS congratulated Mr. Young on the paper and considered that the case recorded in some respects was similar to one he had himself communicated to the society some years ago. It was the cases in which the disease was limited to the cervix without the occurrence of any tubercular lesions in any other part of the body which were so extremely rare. He considered that vaginal hysterectomy was on the whole the best treatment for these cases, and in his own case the patient had remained well for several years after that operation.

DR. GALABIN said that his experience confirmed what had been said as to the difficulty of distinguishing in some cases between tubercle of the cervix and cancer, especially when tubercle was accompanied by a sanguineous discharge. He had had a case in point himself in which the body of the uterus was also involved so that hysterectomy was the only treatment likely to be of service.

DR. RUSSELL ANDREWS described a case of ulcer of the cervix resembling in some respects either a tuberculous or a cancerous lesion which had subsequently proved to be syphilitic.

REVIEWS.

TEXT-BOOK OF MEDICAL JURISPRUDENCE AND TOXICOLOGY. By JOHN J. REESE, M.D., late Professor of Medical Jurisprudence and Toxicology in the University of Pennsylvania; late President of the Medical Jurisprudence Society of Philadelphia. Seventh edition. Revised by HENRY LEFFMANN, A.M., M.D., Professor of Chemistry and Toxicology in the Woman's Medical College of Pennsylvania; Pathological Chemist to the Jefferson Medical College Hospital. Pp. 656. Philadelphia: P. Blakiston's Sons & Co., 1906.

The scope of this volume is clearly indicated by its title, and its value and popularity are shown by the fact that it has reached its seventh edition. It is distinctly a text-book for students rather than a work of reference for the expert. It deals with the main facts concerning the subjects under consideration in a simple and direct manner. Few references are made to definite cases, but occasional case reports add to the interest of the text and show the application of its principles. The chief additions in the present edition are in the chapter on toxicology, which contains recent case reports of poisoning by boric acid, formaldehyde, acetanilid and other synthetic coal-tar products. The work treats of the phenomena and signs of death, medico-legal investigations, including autopsies, presumption of death and of survivorship, personal identity, causes of violent death, feigned diseases, pregnancy, criminal abortion, infanticide, legitimacy and inheritance, rape, insanity, malpractice, life insurance, and toxicology. The last chapter comprises nearly half the volume. H. D.

DISEASES OF THE STOMACH. A textbook for Practitioners and Students. By MAX EINHORN, M.D., Professor of Clinical Medicine at the New York Post-Graduate Medical School and Hospital; Visiting Physician to the German Hospital. Fourth Revised Edition. Pp. 559. New York: William Wood and Company, 1906.

The third edition of this work was reviewed in this Journal in April, 1903, and perusal of the present edition shows that it maintains its former characteristics. Its general excellence is still modified by a lack of condensation and a frequent obtrusion of claims of priority. We still feel that moderate condensation and the publication of this work and the author's small book on Diseases of the Intestines as one volume, would have added greatly to its value, as the subjects are so closely related. The changes in the present edition are the insertion of

remarks on gastroduaphony and on the making of x-ray and radium photographs of the stomach, with illustrations, the insertion of descriptions of additional tests for lactic acid and blood, and of remarks on proper eating. The presence of so-called "occult blood" in the stools of patients, with gastric ulcer, is mentioned, a point of great confirmatory value in the diagnosis of doubtful cases. The radium treatment of cancer of the stomach the writer has found to be of palliative benefit. The discussion of the treatment of gastric cancer and of isochymia is more full than in earlier editions. H. D.

THE MEDICAL STUDENT'S MANUAL OF CHEMISTRY. By R. A. WITTHAUS, A.M., M.D., Professor of Chemistry, Physics and Toxicology in Cornell University. Sixth edition. Pp. 820. New York: William Wood & Company, 1906.

The growth in size of this work since the appearance of the last edition is largely the natural result of the recent advances in physiological chemistry. The opening section, that on chemical physics and general chemistry, has been extensively rewritten and rearranged. This section contains a comprehensive, yet condensed discussion of the general properties of matter, of special properties of solids, liquids, and gases, of physical actions of chemical interest, and of chemical phenomena. The section on inorganic chemistry is practically unchanged, as the writer had previously concentrated it as far as possible with the expressed purpose of teaching the general principles of chemistry rather than of supplying chemical facts. He still arranges the elements in the following groups, according to their chemical characteristics: typical elements, hydrogen and oxygen; elements which form no compounds; acidulous elements; amphoteric elements; basulous elements. The writer does not advocate teaching the subjects in the order in which the matter is presented in his work, but would begin by the study of a few elements and compounds, and consider the general principles treated in the opening section of the book as material for their illustration as supplied. The section on organic chemistry, one of fundamental importance to the student of medicine, has been re-arranged in conformity with increased knowledge of the relationship of organic substances. In the section on physiological chemistry the most extensive changes have been made, as is inevitable in a field so incompletely understood and so constantly the subject of study. The substances, whose composition is known, have been treated in the section on organic chemistry, so this final section is devoted to the study of proteins and other substances of unknown constitution, and to the tissues and fluids of the body and the chemical changes occurring in them. The work has become too well known since its first edition appeared, twenty-three years ago, to require any comments or any eulogy. H. D.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Pregnancy in Uterus Didelphys.—Giuseppe Merlo (*Ann. di Ostet. e Gin.*, June, 1906) illustrates the formation of uterus didelphys by describing a rare case. Uterus didelphys is an anomaly of development which arises at from the eighth to the twelfth week of intrauterine life, before the union of the two cords of Müller into the single genital cord. It probably results from a rapid increase in the transverse diameter of the embryonal cavity with a slow development of the urogenital folds. The vagina in uterus didelphys is generally double, but one vaginal orifice may be closed below, or there may be but one vagina. The hymen is usually double, but in the author's case it was single. The presentation is usually of the small parts of the fetus, and in this case the knee presented. After a long labor, with rigid os, the child was delivered with assistance. The uteri contracted together during labor. Pregnancy usually ends in abortion or premature labor, owing to the small size of the two uteri. In this case the smaller uterus was pregnant and the orifice was so concealed by the hymen that it was not found until the pregnancy had given rise to a suspicion of salpingitis or tubal pregnancy and an operation had been proposed. The stretching of the small uterus gave rise to severe abdominal pain, and menstruation went on from the nonpregnant uterus.

Method of Infection of the Amniotic Liquid by the Passage of Bacteria and Toxins Through the Membranes of the Ovum.—Giuseppe Ranieri (*Ann. di Ostet. e Gin.*, July, 1906), after experiments on animals and *in vitro* to determine the way in which germs enter the amniotic liquid in cases in which the membranes are not ruptured, gives his conclusions. The amniotic sac is formed of three membranes, and when all three are intact, no germs can pass through and infect the amniotic fluid. It can be infected when, with the sac still intact, one of the three layers is imperfect. Death or maceration of the fetus brings about, after a time, changes in the membranes which render them permeable to pathogenic germs. Putrefaction of the amniotic fluid can take place in the presence of a living as well as a dead fetus. Bacteria and toxins, acting on the membranes, render them permeable, so that the poisons are absorbed by the mother and she becomes intoxicated and has a rise of temperature. Toxins pass more rapidly and easily than bacteria. The uterus should be emptied as soon as

possible, since, with its emptying, the danger to the mother is over.

Treatment of Eclampsia.—Pouliot (*Four. de Méd. de Paris*, July 29, 1906) gives the treatment of puerperal eclampsia thus: During the attack, prevent the biting of the tongue and administer chloroform up to the point of relaxation; in the intervals between the attacks keep the patient as quiet as possible in a darkened room, on a water diet, with injections of gruel or artificial serum; give chloral hydrate in heroic doses by rectum, or bromide of potash and morphine. Bleeding is in favor at present. Hasten delivery by introducing a balloon and delivering with forceps, version, or when the child is dead by basiotripsy.

Treatment of Obstinate Vomiting of Pregnancy.—Albert Martin (*Four. de Méd. de Paris*, July 15, 1906) says that the first thing necessary for the treatment of incoercible vomiting of pregnancy is to make the diagnosis. Since it is generally admitted that this condition results from bad functioning of the liver, we must allow as little of the toxins to reach the circulation as possible, and favor the elimination of such as have reached the blood. The treatment consists of milk diet, intestinal lavage, and laxatives. If necessary, we may stop all feeding by stomach, so as to let the stomach rest, give subcutaneous injections of artificial serum, and oxygen and nutritive injections to improve the general condition. After eight days of this treatment, if improvement has not resulted, especially if the pulse remains above one hundred, the life of the fetus must be sacrificed by therapeutic abortion, done in the presence of another physician, and with the signed consent of the husband or the family of the patient. Dilatation is accomplished by the introduction of a balloon or by rapid dilatation, and curettage follows.

Curettage in Puerperal Infection.—M. Demelin (*Bull. de la Soc. d'Obst. de Paris*, Apr. 19, 1906) says that curettage in puerperal infection is by no means always either necessary or advisable. There are many conditions that are positive contraindications to the use of the curette. These are phlegmasia alba dolens, uterine or periuterine phlebitis, pulmonary embolism, visceral complications, pelvic complications, generalized forms of infection, and prolonged infections. In all these such interference is too late. In other cases, more energetic treatment is needed, as in generalized peritonitis and uterine perforations. Other forms make curettage useless or dangerous, as in primitive septicemia, in which curettage is followed by a rapidly fatal ending. A subacute intoxication follows the surgical opening of the vessels, acting as absorbing mouths. Perforation of the uterus during curettage is no imaginary danger in the softened condition of the infected

uterus. It may be followed by severe hemorrhage. The natural barriers constructed against absorption by cellular infiltration or leukocytic reaction are destroyed, and a raw surface is left to absorb the poison. The curette should never be used blindly, but directed by the finger in the uterus. It creates furrows in the lining of the uterus and does not evenly remove the surface, so that decidual fragments may remain behind. In many cases intrauterine antiseptic injections are quite sufficient. Forceps for seizing placental remains are dangerous. The author prefers to make a digital curettage, under anesthesia, with rubber gloves. A complete exploration may thus be made without any danger of perforation or of traumatism to the organ.

Puerperal Uterine Phlebitis.—A. Vaney (*Ann. de Gyn. et d'Obst.*, Aug., 1906) says that coagulation is the result of vascular alteration from irritation of some kind, whether by traumatism, toxins, or infections. Inflammation is in the nature of a defense against the poisoning. Infectious metrophlebitis holds a prominent place in obstetrical venous pathology. A latent endometritis, often of gonorrheal origin, frequently pre-exists, and the congestion, due to pregnancy, acting on diseased veins, with walls infiltrated with young cells, or in old cases sclerosed, and with small abscesses about them, has a marked effect. There is always present, with endometritis, a certain degree of parenchymatous metritis. Capillaries and veins are the seat of excessive proliferation of their endothelium, and have dilated so as to form small angiomas. Congestion brings about hyperplasia, the veins dilate and the walls become friable, rupture, and give rise to hemorrhages and separation of the placenta locally, or premature expulsion of the ovum. The same accident occurs if the poison reaches the genital tract by the general circulation. Microbic intoxication adds itself to physiological antointoxication; normal cellular proliferation is increased; hemorrhage and thrombosis take place, doubly dangerous after the evacuation of the uterus, because they may be the point of departure of an infection, propagated through the extrauterine venous system. In many cases the patient carries within herself the seeds of infection, and it is unnecessary to seek for outside causes. The mucous membrane first reacts to the microbial infection contained in the placental debris, and a local suppuration ends in septic, ill-smelling lochia. Such a form of infection has little liability of propagation, and the septic material is soon drained away in the discharge. When uterine retraction is poor and clots extend into the mucous membrane, the bacteria easily pass into the veins. In general, the thrombosis is confined to the genital tract and the small pelvis. Clots may exist in any of the veins, even up to the inferior vena cava. Abortion as well as labor exposes the patient to these dangers, but the uterus in abortion

more easily defends itself by being less relaxed than after labor. The clot may not be infected throughout, but only at the proximal end. The symptoms are often slight. Fever is an important one, irregular and accompanied by chills. It may be absent and we may have a rapid pulse, increasing in rapidity by bounds, without any marked fever. This is of the greatest diagnostic value, and indicates the obstruction of the circulation by thrombi. Each new increase of pulse indicates a new thrombus. Emboli may be detached, and entering the pulmonary artery cause immediate death. The curves of pulse and temperature will not correspond, the pulse rising when temperature falls. Pain is at the sides of the uterus, disappearing and reappearing with each new thrombus. Meteorism often exists. Among thoracic symptoms are dyspnea and physical signs of consolidation. When the septic process is extensive and fever and chills marked, the diagnosis is easy; but when the process is of moderate extent and severity, the signs are masked. The symptoms come on from the third to the eighth day, usually, the lochia becoming dark and fetid, and false membranes form on any tears that exist.

Labor with Scopolamin-Morphine.—Hocheisen (*Munch. med. Woch.*, Sept. 11 and 18, 1906) gives a very careful analysis of the observations made by himself as to the use of injections of scopolamin and morphine to produce sleep and absence of pain during labor. His conclusion is that scopolamin and morphine injected together, produce, in most women, a state between sleeping and waking, in which the patient feels little, if any, pain. At the same time, scopolamin is a marked poison, and the effects of it on different persons are very varied, so that the physician cannot count, in any given case, on what results he will obtain. Under scopolamin the pupils dilate much more quickly than under atropine. It has a marked effect on motor restlessness. The face is reddened and pulse and respiration are slowed. Thirst is a marked symptom. In poisonous dose it kills by heart failure. In some persons it produces restlessness and delirium instead of sleep. When chloroform becomes necessary for operation, very little need be used to produce anesthesia. The author has observed 60 cases in which scopolamin was used and von Bardeleben 60 others, in the University Hospital. The dose has been from .0003 to .0009 of scopolamin, repeated in some instances twice. Length of labor after injection from fifteen minutes to seventy-nine hours. Only normal cases were treated. Injections were begun when the head was fixed, the cervix almost gone, and the os dilated to the size of a five-mark piece. In half an hour the patient falls into a quiet sleep, from which she awakens during the pains. When more is given there is no waking and no crying with the pains. If operation is necessary, chloroform must be given. The patient does not remember her sensations during labor, but the friends

are made uneasy by the flushed face, and if the patient moans at the contractions, they think the injection has not done any good. For these reasons it is not so useful in private practice as in hospitals. In general, the contractions of the uterus are not lessened by the drugs, but the contractions of the abdominal muscles are diminished. The child's heart must be carefully watched, and if it becomes slow or irregular, an immediate extraction is necessary to save its life. The author found that the duration of labor, in the cases treated, was greater than usual. The third stage of labor was slow and had to be closely watched to prevent accidents. The uterus, in some cases, remains large and soft for some time after labor. Scopolamin is a marked heart poison, and should never be given to patients who have heart or kidney troubles, and the pulse must always be carefully watched, as in some cases it becomes very slow and irregular. It is contraindicated in inertia uteri, general weakness, anemia, fever, stupor, eclampsia, cardiac, pulmonary, arterial and renal diseases, as well as in contracted pelvis. The child is often cyanotic or asphyxiated at birth, and remains sleepy and unwilling to nurse for several days thereafter. Its heart action must be very carefully watched during labor.

Antepartum Measurement of the Fetal Head.—William S. Stone (*Med. Rec.*, Nov. 4) uses the ordinary pelvimeters and does not deduct anything for the thickness of the abdominal wall, because in most instances the wall is surprisingly thin. In making the measurements of the fetal head the examiner stands by the side of the patient, facing the lower end of the patient's body, and grasps the occipital and frontal poles of the fetal head between his two hands while an assistant places, from below, the ends of the pelvimeter between the terminal phalanges of the middle and ring fingers of the examiner, pushing them firmly inward, as the examiner directs. The writer concludes that antepartum measurement of the fetal head is as feasible, at least for the specialist, as is pelvimetry. The measurements afford a more precise method of estimating the course of labor in contracted pelvis than any other now available. They are of the greatest value in the selection of the cases suitable for premature induction, and in the determination of the best time for performing it.

GYNECOLOGY AND ABDOMINAL SURGERY.

The Ganglionic Nervous System of the Human Uterus.—H. Keiffer (*Bull. de la Soc. Belge de Gyn.*, Vol. XVII, No. 2, 1906) calls attention to the great differences of opinion with reference to the existence of ganglia and nerve fibers in the human uterus, and gives the results obtained by him in his studies of the

uterus of a two-months-old infant. From clinical observation we must recognize the presence in the uterus of a power of contraction and relaxation, of inhibition and tonicity which would lead us to suppose that it has within it sympathetic neurons similar to those of the other viscera. The author believes that he has demonstrated the characteristic elements of the nerve cells in the uterus. In the human fetus there are developed in the walls of the uterus and vagina true sympathetic ganglia, comparable to other ganglia of the sympathetic nerve chains. They develop along the intrauterine and intravaginal nerves, and at the second month of extrauterine life, many of them possess a well defined structure and contain many multipolar cells. The author did not, at this age, find separate cells, isolated or grouped, as were found by him previously in the dog and the adult woman.

Warm Water in Metrorrhagia.—Paul Dalche (*Bull. Gen. de Thér.*, July 8, 1906) tells us that there are cases of metrorrhagia at the menopause that are not only not benefited by the usual hot douches, but are made worse by them. In such cases the use of warm douches is most beneficial. The cause of the hemorrhage is, in part, the ovarian ataxia, which, by its loss of power over the vasomotor system, fails to regulate the uterine flow. There is at the same time a sclerosis in some cases, of the elements of the cervix, among others the vessels which undergo periarteritis, and the connective tissue. This sclerosis, often resulting from syphilis, is the main cause of hemorrhage in these cases. The tissues are rigid and inelastic; ergot does not produce contraction of the arteries, and may cause rupture of the walls. The hot douche is vasoconstrictive, and acts on the muscle of the uterus, causing contraction. Such injections are usually too short to produce the desired effect. They draw the blood to the part and leave it there, and vasodilation follows rapidly, facilitating hemorrhage. The warm douche is sedative, especially if prolonged and taken in a state of rest. The temperature should be just below that of the normal body. Warm baths should also be given. Mild purgation should be used, and a diet of milk and vegetables enjoined. Gelatine may also be used internally for its rich lime salts.

Therapeutic Properties of Vanadic Acid as a Topical Application, Especially in Gynecology.—H. Le Blond (*Progrès Méd.*, July 14, 1906) gives us the results of four years' use of vanadic acid as a topical application in the St. Lazare Hospital. It is a very energetic oxidizing agent and has the property of continually generating itself, while very small doses are sufficient to obtain its effects. Very weak solutions produce a better effect than those more concentrated. The author has used the remedy internally, externally for applications in surgical conditions and skin diseases, and in gynecology. Internally it has an excellent effect on all anemic and cachectic conditions, especially in

tuberculosis. The appetite is at once increased and a feeling of well-being brought about. In animals treated with it after experimental tuberculosis there is a formation of connective tissue and a rapid healing of the lesions. Internally, a solution containing gm. 0.015 per liter of water is used. Externally, a solution containing gm. 0.50 per liter of the acid is used. It is a golden colored liquid, without odor. It is used by painting it on and by placing compresses saturated with the liquid on the surface to be treated. It causes no discomfort and cures all wounds rapidly. The author found that if he diluted his solution with three parts of glycerin it had a still better effect, and has since employed this solution. It is useful in wounds, anthrax, tuberculosis, lupus, cold abscesses, ulcers, syphilitic lesions, soft chancres, varicose ulcers, eczema, etc. It hastens granulation and cicatrization. Of gynecological conditions it is of great value in vaginitis. After cleansing the vagina with peroxide of hydrogen, the solution is applied on tampons, saturated with it, which fill the whole vagina. These are changed once in twenty-four hours. The application occasions no discomfort and no inflammatory reaction takes place. The vaginal walls lose their redness and sensitiveness, and soon return to a normal condition. Acute cases yield rapidly, while no chronic one has continued more than two months after treatment was begun. In urethritis the results are not so brilliant, since the applications are not so easy. The bladder is washed out with the solution and the urethra is packed with thin tampons, saturated with it. The effects are good. Metritis has been treated in forty cases. The uterine cavity is tamponed with the solution, after dilatation, when that is necessary. Applications are made every other day. The discharge soon becomes less and cure results. It is preferable to ichthyol and creasote on account of the absence of odor and of disagreeable results.

Prevention of Peritoneal Infection by Injection of Nucleinic Acid.—R. Romme (*Presse Méd.*, Sept. 5, 1906) advocates the injection of nucleinic acid as a preventive measure before peritoneal operations. It produces an artificial leukocytosis and increases the resistance of the peritoneum to infections. Of fifty-one hysterectomies for uterine cancer operated on at Breslau, the mortality was 21 per cent., against 32 per cent. in cases in which no injections had been given. The injections are well borne, but produce a reaction, with elevation of temperature, some swelling and pain, coming on ten hours after the injection. Chills and general malaise are usual.

Gonorrhea in Women.—Frs. de Martigny (*Jour. de Méd. et Chir.*, Sept. 22, 1906) says that gonorrhea in the female begins insidiously, so that during some weeks of infection the patient does not suspect it. Infection comes generally from connection with the husband who believes himself cured of the disease.

and has simply a few drops of secretion left, or filaments in the urine. Some irritation, such as excessive intercourse or use of liquor, causes the discharge to reappear with gonococci present. If before examining a case of supposed cured gonorrhea the meatus and urethra are irritated by injection of weak nitric acid, the gonococci will reappear in the same way. In other cases the husband has illegitimate connection and brings the disease home and infects the wife. Rarely the woman infects herself by the use of public toilet conveniences or towels. The gonococci are kept for a long time shut up in the glandular structures in the male, so that the microscope does not find them. The infection does not at once reach all parts of the female genitals, but is frequently localized for some time in the glands of Bartholin. This is especially frequent in young women. The symptoms are heaviness and swelling of the vulva and glands, and appearance of pus in the orifice of the gland, surrounded by a red macule. Fluctuation may be detected; the gland opens and leaves a fistulous opening, or the condition becomes chronic. The vagina makes a very bad culture medium for the gonococcus on account of the impenetrable nature of the epithelium. When it is infected it becomes eroded at the entrance and profuse, greenish pus, full of filaments, appears. The epithelium of the cervix, on account of its many glands, is a good culture medium and is easily infected. The secretion becomes exaggerated and greenish, and lancinating pain occurs, with swelling and redness of the part. The infection is always communicated to the lining of the uterus by continuity, and the germs enter the epithelial cells, and penetrate into the mucous membrane to the depths of the glandular culs-de-sac. Pain and purulent discharge increase and the next menstruation is a real hemorrhage, with fever, nausea, vomiting, and fainting attacks. Metritis (or salpingitis) comes on. Gonorrheal salpingitis and peritonitis are frequently fatal when a previous endometritis exists. In little girls in bad health, especially if they masturbate, a vulvovaginitis occurs which is not occasioned by the gonococcus, but that is still contagious. It is the scourge of institutions where girls are kept, epidemics that are most intractable coming from the infection of many from a single case by the use of towels, thermometers and such instruments used in common. When the gonococcus is found it rarely comes from connection, but from the use of the night vessel or towels. The vulvovaginitis of children goes through the same stages and complications as it does in the adult. Arthritis is quite common, coming on from one week to ten months from the time of infection. Treatment of gonorrhea consists of copious washings and douches with antiseptics, preferably permanganate of potash, taken lying down, with the bag only slightly elevated, three times a day; and tampons large enough to fill the vagina

saturated with medicated glycerin. Bartholinitis requires the opening of the glands, and their destruction by cautery or curette. When the uterus is infected the cervix and lining membrane require an application of iodine or zinc after dilatation. When the tubes and ovaries are affected hot douches, ice applications to the abdomen, milk diet and suppositories of belladonna are in order. In chronic gonorrhea which is seen usually in the form of metritis, douches, astringents and caustics to the cervix, with tincture of iodine to the abdomen are useful. The author estimates that 65 per cent. of salpingitis cases are due to the gonococcus, and one-half of the balance to puerperal infections. Another result is extrauterine pregnancy, from the destruction of the ciliated epithelium of the tube, so that the ovum is not carried down into the uterus. Phlebitis is not rare, and arthritis is a common complication, while pleurisy and meningitis occur. Most women have one pregnancy and then become sterile.

Infectious Genital Herpes in Women.—Lutaud (*Jour. de Méd. de Paris*, Sept. 2, 1906) describes a form of herpes of the genitals or of the mouth which occurs in women who are the subjects of infection either postpartum or postabortion. The patient has the usual symptoms of puerperal infection and all of them improve so that there is no longer any anxiety. Then there comes on a sudden rise of temperature with chills, which ends in the appearance of herpes of the genitals or the mouth and a fall of temperature. Whenever the physician observes a renewed rise of temperature after puerperal infection he should be on the lookout for herpes of vulva or mouth. These herpetic eruptions are only a consequence of the infection. Genital herpes is always preceded by chills or malaise, and appears in women who have some genital disease that causes a mild infection. It occurs after the menses in women who have fibroma or other uterine disease.

Prophylaxis and Treatment of Vulvoperineal Lacerations.—C. Merletti (*La Rif. Med.*, May 5, 1906) advocates, as being the best in theory and giving the best practical results, the method of saving the perineum which accomplishes the delivery in two acts, first delivering the greatest transverse diameter and then the greatest anteroposterior diameter. Episiotomy has its advantages and disadvantages. When incision of the perineum is considered necessary, the author advocates the incision of the mucous surface, instead of the skin, as he believes the resistance to be greatest not in the cutaneous ring, but at the level of the fragments of the hymen. In repairing lacerations when they occur he uses the method recently proposed by Bumm, which has horizontal sutures including all layers of the perineum, and three or four in number. All lacerations up to the third grade may be repaired by this method. Such sutures present a good resistance to the infiltration of the lochia.

DISEASES OF CHILDREN.

Maternal Syphilis.—Geo. S. Whiteside (*Jour. A. M. A.*, Oct. 7) advises that we look more often for this disease, as its presence will often explain obscure symptoms. In pregnant syphilitic women give mercury promptly and fearlessly, as only in this way can the health of the fetus be protected from the inherited taint. Give the syphilitic infant every care and mercury. The child should recover entirely in a few months.

Variations in Fat Percentage of Milk.—Louise Tayler-Jones (*Arch. of Ped.*, July) says that the importance of fats in infants' food has been more fully appreciated since such an important role in infantile atrophy (marasmus) has been assigned to them. For the most part, fat gradually increases in amount from the beginning to the end of a breast-feeding, with occasionally a dip down at the end. As yet there is no proof that the increase is arithmetical. A baby that needs more fat than it is getting can easily be put to the breast after some milk has been pumped out. A fat percentage, within a few tenths of one per cent. of the average may be obtained by taking equal specimens from the beginning and end of the feeding and examining the mixture. This is entirely practicable clinically and should be done.

Hyperlactation.—In determining the frequency of this practice A. Dingwell-Fordyce (*Brit. Jour. Child. Dis.*, July) has noted the cases of 645 children, 139, or 22 per cent., of whom were nursed after twelve months of age. Even partial breast-nursing for longer than twelve months can be regarded in no other light than as a severe physical strain for the mother. In addition there is the constant possibility of a supervening pregnancy with its added strain. The overlapping of pregnancy and lactation occurs in 24 per cent. of all mothers in this class. Only too often, in such cases, it is found that on the birth of this infant the mother is quite unable to satisfactorily suckle for any length of time, and even when capable of doing so the value of her milk is, in many cases, unquestionably diminished. Maternal milk during the second year of lactation admittedly is insufficient as the sole food of a child, and those children whose nourishment at this period depends largely on it are found to develop various symptoms of weakness and debility, while the mother often regards the nature of any subsidiary nourishment as entirely a matter of secondary importance. Where pregnancy supervenes the fetus conceived is apt to suffer, and, in addition, a maleficent influence is exercised over the prospects of later children in the family. The risks introduced into their lives are those incidental to diminished ability on the part of the mother to suckle and also to a diminished value of her milk. From every point of view the practice of prolonged lactation is eminently unsatisfactory, the risks are real, and the compensating advantages are conspicuous by their absence.

Congenital Abnormality of Genitourinary Organs.—G. F. D. Smith and A. L. H. Smith (*Lancet*, July 21) describe a congenital condition in a female infant five days old. Protruding from the urethral orifice was a portion of the bladder wall, showing one ureteral opening and a cystic swelling. The protruding portion was replaced by the finger but prolapsed several times, the cystic swelling being smaller each time. Death occurred suddenly. The autopsy showed a dilated accessory ureter either with a blind cystic ending in the bladder wall or with ballooning of its lower end due to congenital narrowing of its orifice. The treatment pursued was dictated by the marked and progressive decrease in size of the protruded swelling and by the total absence of any morbid signs or symptoms exhibited by the child with the exception of the protrusion. Had the condition of the accessory left ureter been ascertained before death, doubtless it would have been better to have made a free communication between the bladder and the cyst, but even as it was the cyst apparently collapsed and the ureter did not, so that probably that treatment would have failed also.

Temporary Feeding by Cereal and Vegetable Preparations in the Gastroenteritis of Infants.—Louis Netter (*Le Progres Med.*, June 30) advocates the use of cereal and vegetable soups and gruels as a substitute for milk when it is necessary for several days or for a longer time to discard the use of milk on account of gastrointestinal symptoms. The digestive organs of the child have been shown to adapt themselves to the digestion of starches when these elements are given to the stomach to work on. There are four sorts of soups that he considers useful. Babeurre is the milk which is left after fermentation and the removal of cream and contains almost no fats. The fresh milk is allowed to ferment in a closed dish for twenty-four hours, with occasional agitation. The milk is then churned for thirty to forty minutes to remove the butter. For each liter of fluid there is added a tablespoonful of wheat, rice, or corn flour, and the mixture is allowed to boil for five or six minutes. Then eighty grams of sugar are added and it is taken from the fire. It may be given in the bottle or with a spoon, in amounts equal to the usual feedings of the child with milk. It may be given to children from two weeks to eighteen months of age. It is slightly acid, contains no fat, and a good proportion of albuminoids and sugar. It is especially useful for diarrhea and vomiting. New-born children do not do well on it, and it must not be used too long at a time. The best preparation as a substitute for milk is Mery's vegetable soup. For every liter of water there should be added sixty grams each of carrots and potatoes, and twenty-five grams each of turnips and peas or dried beans. The soup boils for four hours in a covered pan; then there is added five grams of salt per liter of soup. It must be made fresh every day and may be used plain or in place of

milk to make cereal gruels. It may be given to children from eighteen days to eighteen months old, and will succeed for quite a long period after a water diet. The infant gains in weight by rehydration of the tissues under the influence of the chloride of sodium. Comby's soup is very similar to this, being made of three cereals: wheat, barley, and corn; and three vegetables: lentils, peas, and beans. It boils down to one liter and has twenty grams of sea salt added. It is used to make gruel with wheat, barley, or rice, one tablespoonful being used to 250 grams of soup. This contains more phosphates and sulphates than Mery's soup and is richer in carbohydrates and vegetable albumins. Still better results are obtained by malting the starches before administering the soup. They may be made soluble or saccharified. Only the first effect is desirable. The soup is digested with plain malt. Add to fifty grams of flour one third liter of milk and two thirds of a liter of water, one hundred grams of malt. Heat it to boiling for several minutes. Malt soups are indicated as a transition feeding between water or vegetable soups and milk. They should not be used when there is an existing infection or vomiting, or under four months of age.

Effect of Alcoholic Dextrins on Some Cases of Marasmus.—

W. Langford Symes (*Brit. Jour. Child. Dis.*, July) says that in some cases which defy all efforts and most approved methods of feeding, where cow's milk has failed and has been abandoned even though skilfully modified, peptonized, or condensed; where breast-feeding has likewise failed with mother or wet nurse; where asses' milk has been abandoned as insufficient to arrest the downward course, where patent foods have possibly aggravated matters, and where special marasmus foods, such as bread-jelly, wine whey, eggs, meat-juice, and brandy, have alike disappointed us; where the case seems hopeless, the administration of XXX Dublin stout with, after a time, the addition of proteids and fat, will often save life. Stout may be roughly described as an extract of malt containing abundant carbohydrates in the form of dextrins, no starch, no sugar, and a small quantity of alcohol averaging about 5 per cent. All the serious cases of infantile atrophy where collapse is great, the surface and extremities cold, and the temperature low, are benefited by alcohol, and it is here combined with the carbohydrate in a ready form for administration. Proteid can be easily supplied by beef-juice, and fat by cream or yolk of egg. It is not unpleasant; the child takes it well from the bottle; it mixes with milk, not only without harm, but also aids its digestion; while if the child is at the breast, as in one of the foregoing cases, the porter in no way disagrees. The writer reports several cases successfully treated with stout. He generally orders Guinness' XXX stout one-half ounce, hot water, one-half ounce, cream, one-half to one dram, fresh beef-juice two to three drams, sugar, every four hours. No vomiting, hiccough, flatulence,

or diarrhea has been observed. In no case did it intoxicate the child or make him drowsy, but he took his feedings with enjoyment and was satisfied afterward. After a time extract of malt is substituted for the stout, and the child gets on to milk again. In cases where alcohol is contraindicated or not required hop wort, which is unfermented stout, is deserving of trial. It is a thick, sweet, brown liquid, containing all the ingredients of stout, except that sugar replaces the alcohol. It could, perhaps, be obtained from breweries, but in the collapsed states of sinking marasmus the alcohol is usually needed.

Tuberculophobia and Some of its Effects on Infantile Medicine.—Rousseau-Saint-Philippe (*Ann. de Méd. et Chir. Inf.*, July 15, 1906) deplores phthisiophobia and its effects in failure to diagnose the true condition in many affections of children, which are erroneously pronounced tuberculous. It is forgotten that for the germ to thrive there must be an appropriate soil for its growth, that those affected are those who have a predisposition, hereditary or acquired, permanent or temporary, and that our duty is to see that there are no such predisposed persons produced as a result of bad hygiene and bad feeding. The author has, at Bordeaux, a clinic for children from a day old up to fifteen years, the object being to teach parents how to nourish their children so as to prevent tuberculosis. He calls our attention to the extreme rarity of pulmonary tuberculosis among children, in comparison with its frequency in the adult and the frequency of the disease in children in other organs. Tuberculosis is improperly diagnosed and recoveries are recorded in cases where it never existed; but worse than this, families are broken up in an attempt at cure. The lymphatic system reacts to the slightest causes, and glands enlarge that are called tuberculous, but that disappear in a few weeks or months. Skin troubles, catarrhs, bruises, burns, all give rise to these suspected gland enlargements. Tubercular tracheo-bronchitis is diagnosed frequently in life, while we are told by pathologists, that only on the autopsy table can this condition be surely diagnosticated. The suspected physical signs are the result of old pneumonic or bronchial conditions that soon disappear under appropriate treatment. Old cases of whooping-cough, resulting in chronic coughs, emphysema, bronchial and cardiac dilatation, are mistaken for pulmonary tuberculosis. Grippe followed by hemorrhage is another cause of false diagnosis of tuberculosis. If the abdomen be enlarged from enterocolitis, tuberculosis is invoked as a cause. If the joints are swollen and painful, tubercular arthritis is the dictum. Any brain symptoms are referred to tubercular meningitis. Finally, the author believes that we are making a mistake in speaking of the pretuberculous state. There is no such state, but there are conditions of ill-health that render the patient liable to contract tuberculosis, and these persons we should rather call tuberculizable.

Early Electrical Treatment of Acute Poliomyelitis of Children.—Ezio Luisada (*Ann. di Elet. Med. e Ter. Fis.*, July and Aug., 1906) says that in the children's ward of the hospital at Florence, it has been his experience that those cases of poliomyelitis that have had electrical treatment early in the disease have recovered more quickly and more thoroughly than those in which it was delayed until some time after the subsidence of the fever. The author has treated 170 cases of this disease. The patients are rarely seen in the initial stage, when the fever is high, and the diagnosis is difficult at this time. In the second stage, immediately after the fall of temperature, the paralytic symptoms come on. As soon as the inflammation of the cord is over, with its hyperemia, compression and destructive phenomena, the time has come for an electrical examination to ascertain the amount of damage that has been done, and mild electrical applications may be begun with advantage to the patient. If the indifferent electrode be placed over the brachial plexus and the lumbosacral region, the nerves and muscles may be stimulated without any danger of injury to the spinal cord. The muscles and nerves will thus be kept in good trophic condition and the circulation will be kept up by the applications, and when the centers are regenerated, the nerves will be all ready to respond to their stimuli. The electrical treatment should begin in from fifteen to thirty days from the beginning of the disease. In very young children the nerve centers are not yet fully developed and the portions destroyed may be replaced by the development of new areas.

Ascarides and Meningism.—Taillens (*Arch. de Méd. des Enf.*, July, 1906) describes as meningism a syndrome of symptoms that are suggestive of organic brain trouble, but which arise from reflex causes such as gastrointestinal troubles, and especially ascarides. The infant must have a nervous predisposition in order to be affected in this way, for intestinal worms exist in many cases without producing any serious symptoms at all. In predisposed subjects all may go well until there is some gastric or other disturbance of the system, and this will precipitate a series of very serious symptoms, including convulsions and coma. This must depend on either the mechanical irritation produced by the worms, or some poisonous substance secreted by them, which suddenly has a toxic effect on the nervous system. Such a toxic substance has been demonstrated in crushed bodies of ascarides, and has produced serious ocular inflammations when it has accidentally been applied to the conjunctiva. Injected into animals it has produced death. It must be this poison emitted by the worm which acts on the nervous system that causes the serious symptoms which are often very difficult to differentiate from true meningitis. High fever and slow pulse are in favor of brain trouble.

Enteritis and Appendicitis in Children.—M. Guinon (*Rev.*

Mens. des Mal. de l'Enf., Aug., 1906) says that in the adult appendicitis is relatively rare in the course of true chronic mucomembranous enterocolitis, but in the child there are no cases of appendicitis without enteritis. When colitis localizes itself in the cecum there is almost always appendicitis. Out of 135 cases of enteritis observed by the author, he has found twenty-eight patients affected with appendicitis, and in twenty-three of them there had been a previous enteritis. All forms of enteritis that precede appendicitis predominate in the large intestine. Mucomembranous enteritis in children has not the type that is found in the adult. Pain is slight and lasts but a little while. It occurs most often when there is an appendicitis, but even here it is not marked, and is produced by palpation. All forms of enteritis are found in children, and all forms of appendicitis as well. The appendicitis is a simple propagation from the neighboring intestine, and is a chronic malady. In many cases it is preceded by an infection resembling grippe, a rhinopharyngeal infection, and an adenoiditis, and this seems to be an etiological factor. The appendicitis is most often preceded by an acute mucous enterocolitis, and this by an acute or chronic adenoiditis. The adenoiditis and the enterocolitis are the intermediate steps between the grippe and the appendicitis. Hence the value of prophylactic treatment by antisepsis and curettage of the pharynx, antisepsis of the digestive tract, a vegetable diet, and repeated purgations as preventives to appendicitis.

Acute Infantile Intussusception.—Henry J. Dunbar (*Sect. Med. and Surg. Jour.*, Aug.) discusses this subject on the basis of fifty-nine tabulated cases. He says that after the introduction of air or water into the bowel reduction may appear to have been accomplished, and yet the condition be left worse than before with the loss of several valuable hours. A bad tear of the bowel short of complete rupture, or a small leak, may escape detection and lay the foundation for a rapid and fatal peritonitis. Taking everything into consideration, it would appear that the only safe thing to do in the interest of the patient is to open the abdomen immediately after the performance of irrigation to make sure that everything is right or to perform the irrigation with the abdomen open. If so, why not avoid the irrigation altogether? Statistics are entirely unreliable in this disease. Were it not so the actual results would make out an overwhelmingly strong case for laparotomy. In intussusception particularly there is a tendency to record successful cases, not unsuccessful ones. To draw conclusions of any value from statistics one would require to have two extended series of cases: one series treated by irrigation and the unsuccessful cases which afterward succumbed to operation counted as deaths, and the other series treated by laparotomy and not to include cases which

had previously been failures under irrigation and which died after operation. The following suggestion is offered by E. Eliot, Jr. (*Surg. Gyn. and Obst.*, Aug.) for application in cases of neglected intussusception. It has not been tried, but seems warranted by the high mortality of resection. After opening the abdominal cavity, the intussusception is identified, and reduced, as far as possible, without the use of either excessive or unduly prolonged effort of expression or traction. The small intestine is then sutured at its point of entrance to the margin of the intussusciens by several interrupted silk sutures extending through the serous and muscular coats. These sutures insure the formation of sufficient adhesions between the viable part of the bowel to prevent extravasation of intestinal compounds, when nature subsequently separates the sloughing intussusceptum from the adjacent viable gut. The entire intussusceptum is now returned into the abdominal cavity, with the sole exception of that portion corresponding to the apex of the intussusceptum. At this point, suitably protected by pads and held up by a pair of silk ligatures, the intussusciens is opened longitudinally, exposing the apex of the intussusceptum. A soft rubber or silk catheter is then passed, if possible, through the intussusceptum, beyond the constriction, into the bowel above, the escape of the accumulated fecal material and gas being prevented temporarily, until the edges of the divided intussusciens and the parietal peritoneum are united, by placing a clamp on the catheter. In this way the obstruction may be relieved until the patency of the intestine is again restored by the discharge of the intussusceptum either through the opening in the intussusciens or through the rectum. That the passage of the catheter in the manner described is feasible was demonstrated in the autopsy of one of the writer's cases, where it passed without difficulty beyond the constriction, as well as in a case of Ouvry and in a similar case that was recently observed by the writer in the living subject. If the passage of the catheter is unsuccessful, an enterotomy made in the manner described would facilitate the ultimate discharge of the sloughy intussusceptum.

Size of the Spleen in Rickets.—The diversity of opinion of authorities as to the enlargement of the spleen in rickets has induced J. M. Cowan and J. C. McClure (*Brit. Jour. Child. Dis.*, Aug.) to examine 417 consecutive cases of this affection with reference to this point. The spleen was found to be palpable in only 17, or 4.07 per cent. of these cases. In only eight of the seventeen cases was the enlargement definite, and in five of these the thoracic deformity was considerable. Trousseau contends that in such cases of deformity the spleen may be felt beyond the ribs, even when not enlarged. In two cases only was the splenic enlargement notable. One of these showed blood changes of splenic anemia; the other was suffering from measles and died

during the attack. The writers regard marked increase in size of the spleen in rachitic cases as due to other causes than those of the disease itself, the most common being splenic anemia and congenital syphilis.

Acute Phosphorus Poisoning.—B. J. Courtney (*Brit. Jour. Chil. Dis.*, Aug.) reports a case of acute phosphorus poisoning in a girl aged twelve years, due to sucking friction matches. There were only slight gastric pain and vomiting two or three times. A purgative was given. For five days there were only slight gastric pain, loss of appetite and some drowsiness which increased on the sixth day with repeated convulsions, slight jaundice and some enlargement of the liver. No urine was obtained. Coma and death rapidly supervened. The autopsy showed redness and hemorrhagic erosions of the stomach and advanced fatty degeneration of the liver. The writer records this case as emphasizing the necessity of treating a suspected case of match-sucking or other form of phosphorus poisoning at once, without waiting for confirmatory symptoms to develop.

Acute Suppurative Thyroiditis.—Frank S. Meara and R. S. Macgregor (*Arch. of Ped.*, Aug.) first saw the patient, a male child, at the age of $3\frac{1}{2}$ months. The family history was unimportant. The baby was perfectly healthy for two months; then developed a suppurative cervical adenitis which was incised. Three weeks later an acute febrile condition with cough developed, called by a physician pneumonia. When seen by one of the writers there were no signs of this disease, but enlargement of the thyroid, dyspnea and a temperature of 101° . During the next twelve days dyspnea increased, until very alarming. The thyroid was greatly swollen; the isthmus was fully a centimeter broad and nearly as thick. Both lobes were enlarged, especially the left. The gland was tender and fluctuated indefinitely. Intubation gave immediate relief. A week later the tube was tentatively removed, but severe obstructive dyspnea recurred at once and it was replaced. A few days after this incision was permitted and about an ounce of pus was evacuated from the gland. Recovery was rapid. This case was evidently not one of the very rare apparently primary cases. It was secondary to either the suppurative adenitis or to the acute febrile affection which preceded its appearance and which would seem to have been influenza.

Osteogenesis Imperfecta.—E. D. Fenner (*Arch. of Ped.*, Aug.) reports the following case as an instance of this condition. The family history was negative. The patient, a boy of five years and eight months, was the sixth child. He was strong and healthy until four months old, when he was removed from the breast and put on condensed milk. This change was followed by diarrhea. The first tooth was cut at between one and two years of age. He did not walk until he was two years

old. The fontanel, previously very large, did not close until he was four. Soon after beginning to walk slight falls were followed by pains, lameness and deformities, which were subsequently found to have been due to fractures. A year before he was seen by the writer he was operated upon, with poor result, for supposed coxa vara. X-ray examination by the writer showed the deformities to be due to old fractures, only five of which are known to have occurred.

Hemiplegia Following Diphtheria.—On account of the apparent rarity of this occurrence, W. J. Butler (*Arch. of Ped.*, Aug.) records the case of a girl ten years of age. On the etiological factor he regards encephalitis as improbable and peripheral neuritis as excluded by the involvement of the entire side, retention of reflexes and existence of spasticity in the affected members. The explanation which he considers most plausible is that acute myocarditis followed the diphtheria, with acute dilatation, the resulting circulatory disturbance favoring the formation of a thrombus in the left heart and cerebral embolism from dislodgement of a fragment of such a thrombus.

Experimental Cerebrospinal Meningitis and Its Serum Treatment.—Simon Flexner (*Four. Amer. Med. Assn.*, Aug. 25) finds that the lower monkeys can be infected without great difficulty with diplococcus intracellularis and made to reproduce the pathological conditions present in man in epidemic cerebrospinal meningitis. The cocci, when introduced into a low level of the spinal canal, would distribute themselves in a few hours through the meninges and excite an inflammation, the exudate of which accumulated chiefly in the spinal meninges and those of the base of the brain. The uniformity with which the chief exudate was found at the base of the brain and the rarity of its appearance in considerable amounts over the convexity led the writer to doubt the validity of the reasoning which ascribed this localization in man to the entrance into the meninges of the infectious agent directly through the nasal mucous membrane. This tendency to localization at the base of the brain in monkeys is especially interesting because they usually lie down only a short time before death. In man and experimentally in the monkey encephalitis and abscess formation due to invasion of the substance of the brain occur. A subacute form of meningitis is very difficult to excite in monkeys. The injections produce either an acutely fatal meningitis or an acute form with rapid recovery. Early emigration of leukocytes, active phagocytosis and dissolution of the cocci within and without the leukocytes are favorable signs. Still, the monkey may succumb when cocci cannot be found in smears or obtained in cultures from the inflamed membranes. The antisera employed were prepared in rabbits, goats and large monkeys. The rabbits were unsatisfactory, as many died and they yielded

little serum. The goat developed an agglutinating serum quite rapidly, 250 grain guinea-pigs were injected with 1 c.c. of this twenty-four hours before the cocci were injected, and also simultaneously with the injection of the cocci. The pigs receiving the serum survived; the controls died. Another pig survived after cocci had been injected thirty hours after giving 0.1 c.c. of serum intraperitoneally and 1 c.c. subcutaneously. The antiserum of a rabbit which had been injected with the diplococci and guinea-pigs aggressin was given simultaneously with the cocci to other guinea pigs, giving 1 c.c. intraperitoneally and 0.5 c.c. subcutaneously. These survived. Those given 0.5 c.c. intraperitoneally and 0.1 c.c. subcutaneously finally died. The controls also died. Some pigs were saved with doses of 0.5 c.c. one hour after infection. Too little rabbit serum fails to protect, too much is unfavorable on account of its own toxicity. The goat's serum was found to be certainly protective in doses of 0.1 c.c. and variably protective in doses of 0.02 to 0.01 c.c. It was also effective when given intraperitoneally two or four hours after an injection, but after this time even larger doses would not save the guinea-pigs. Injection of goat's serum into a spider monkey was followed by its death, while the control monkey recovered from the injection of the cocci alone. Two large macacus monkeys were then immunized by injections of diplococci and exudate from guinea-pigs for the production of a homologous serum. Five monkeys were treated with this serum and five controls were employed, these dying, as did one of those treated; the others recovered. In guinea-pigs the occurrence of hemorrhages in the mesentery, diaphragm and adrenals was noted. The antiserum prevented these lesions even when it failed to save the pigs. The immune serum from the monkey was effective in the guinea-pig. How far these results can be applied therapeutically and prophylactically in man is uncertain, but the writer does not favor the injection of alien sera into the spinal canal until their action has been more thoroughly worked out in monkeys.

Results of the Consultations for Infants.—Pierre Budin (*L'Obst.* July, 1906) collects the results of the consultations or clinics for nursing mothers and their infants that have been established in many parts of France, with the object of teaching the mother how to nurse and care for her infant, and of stimulating the mother to nurse the infant instead of feeding it artificially. The result of these clinics has been excellent. It has lowered the death rate in every locality where a clinic has been established, and the prevalence of gastrointestinal diseases is much lessened. The infant is undressed, weighed, and the mother given such counsels as are necessary, according to the condition of the child. Many more mothers are anxious to nurse their children, and washerwomen have been told by their employers to nurse the infant, instead of leaving it to be fed

during the day, the mother being permitted to bring her infant to her work, or to go home to nurse it at stated intervals. The death rate is lowered one-quarter to one-half, thanks to the advice of the physicians in these clinics. Such clinics have been of the greatest value in administering the law as to the care of foundlings, which are brought by their nurses regularly for advice. Such clinics have been established in connection with crèches and have been of great value.

How to Obtain a Normal Aseptic Milk.—G. Linas (*Presse Méd.*, July 7, 1906) states that sterilization does not give a normal milk, but one that is changed in its physical and chemical characteristics, and has lost its vital power. If we can obtain a milk direct from the cow that is aseptic we shall have a much better substitute for human milk than we have now. But such milk supply cannot be obtained in the ordinary commercial way. It must be produced at a special dairy where the herd of cows is first subjected to physical tests that render it certain that they are perfectly free from all forms of disease. Then they must be fed on specially selected foods, all brewer's waste and similar food being discarded, and fresh forage allowed only in special quantities, since pasturage renders the milk liable to cause diarrhea. The food should consist of dry grains, dried grasses and cereal meals. The use of cooked potatoes increases the amount of sugar in the milk while it lessens the casein; cereals and lentils increase the organic phosphates of the milk. In good weather the cows should not go to pasture until after they have been fed, so that they will not eat their fill of fresh fodder. The milk is to be obtained aseptically. The most rigorous cleanliness of the stable and of the animal, with washing of the udder and hind-quarters before milking will prevent infection with the colon bacilli, and the most rigorous cleansing of the utensils and hands of the milkers will tend to keep the milk pure. The milk should pass into the pail through filters of aseptic cotton. Such milk is suitable for the nourishment of the infant. The cow has become, not a machine to produce milk, but a child's nurse, carefully selected, carefully fed and cared for so as to produce a selected milk.

Infant Diet in Summer.—The proper care of an infant in warm weather, according to Godfrey R. Pisek (*Jour. Amer. Med. Assn.*, Aug. 11) includes keeping a light woollen garment over the abdomen to prevent sudden chilling of the skin and consequent retention of heat by suppression of perspiration. The infant should be bathed twice daily to remove fat and salts left by the evaporated sweat. These retard the evaporation of perspiration and thus partially prevent heat excretion. Plenty of cool boiled water should be given to drink, so as to replace water lost as perspiration. The food of all well infants should be Pasteurized to retard decomposition. If the weather is close or muggy or the humidity is high the food should be diluted to

one-half with boiled water. In very humid weather with high temperature milk should be stopped altogether and gruels given until the humidity is diminished. On warm, humid nights, milk feedings should not be given, because the humidity is greater at night than in the daytime, although the temperature may be lower. Gruels or whey, which produce little heat, should be given. For diarrhea give castor oil or calomel to remove decomposing food. Stop all milk feedings temporarily. If the air is hot but dry, milk feedings may be resumed soon; if very humid, give gruels or whey and return cautiously to milk. Provide a circulation of air, as stagnant air soon becomes saturated with water vapor and no more perspiration can evaporate and absorb heat.

The Amount of Milk Necessary and Sufficient for the Infant.—Ch. Richet and E. Lesne (*Arch. de Méd. des Enf.* Aug., 1906) states that the amount of milk necessary for the infant does not depend on its age, but on its size, and that its size should be reckoned rather by its surface than its weight, for the function of the food is in great part a thermal function, the combustion of the food being proportional to the thermic radiation. This radiation is proportional to the skin surface, which may be approximately estimated. Experimental mensurations have been collected into a table by reference to which we may find the amount of surface by looking for the weight of the child, without any serious calculations being necessary. There is needed for infants during the first month twenty-two grams of milk for every square decimeter of surface, while later in life this quantity becomes less, being reduced to eighteen or twenty grams. It averages twenty grams. During the first twelve months the physiology of the infant is profoundly modified. In the new-born a great part of the food is used in fixing the tissues, while at twelve months its surface being well developed, and the thermic radiation being considerable, the fixation of tissues is less important, and only three per cent. of the milk ingested is used in this way. Much more is used in producing heat. In the adult none of the food is expended in fixing tissues.

Intubation of the Nasal Passages in Severe Coryza in Nursing Infants.—Minerbi and Vaccari (*Rif. Med.*, Aug. 11, 1906) refer to the dangers due to severe coryza in nursing infants who are unable to nurse or to sleep quietly owing to the occlusion of the nasal passages. Such infants gradually starve to death. Some operators have even done tracheotomy to save the lives of such children. In the Maternity Hospital at Ferrara the authors have made use of a simple apparatus for intubating the nasal passages in coryza. It consists of a rubber bandage 15 mm. wide passing from the nose about the back of the neck, the front of which is perforated by two holes, into which are inserted two Nelaton's sounds 65 cm. long, number 11 or 12, which pass

into the nares. The use of this apparatus is not attended by any danger or difficulty. After sterilization by boiling it is introduced into the nares and the rubber band fastened behind. The child is then put to the breast and finds no difficulty in breathing or nursing, while its sleep is quiet and uninterrupted.

ERRATA.

The publishers of *The American Practice of Surgery*, an important new work, reviewed on page 739 in this Journal for November, are Wm. Wood & Co., of New York.

The correct title of Dr. Longyear's paper, page 586, should be
KIDNEY AND COLON SUSPENSION BY THE USE OF THE NEPHRO-
COLIC LIGAMENT AND GEROTA'S CAPSULE.
(Nephrocolopexy)

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